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TYPE SPECIMENS OF FOSSIL INVERTEBRATES
IN THE SAN DIEGO NATURAL HISTORY MUSEUM

BY

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SAN DIEGO, CALIFORNIA

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INTRODUCTION

This catalogue is published in compliance with Recommendation 72D of the International Code of Zoological Nomenclature, which states (ICZN, 1964:75): "Institutional responsibility. — Every institution in which types are deposited should . . . (4) publish lists of type-material in its possession or custody . . ."

The main part of the catalogue is arranged systematically by phyla and a few subordinate categories. Within these, the genus and species-group names, as originally published, are listed alphabetically. A simple cross-index ("see") refers the reader from one name to others if more than one name has been applied to the same type. Each entry also contains, respectively, the author of the lowest species-group name cited, a bibliographic reference for the publication in which the name appeared, the type category and type number (with literal suffixes if specimens are of more than one piece) of the specimen in the San Diego Natural History Museum, the geological age of the type and the formation from which it was obtained, and the general locality from which the type was collected. In most entries, age and formation are given as they were in the original publication.

"Missing" following a type number means that the specimen seems once to have been in the collection but it cannot be found now.

Inclusion or omission of figure references in the citation indicates that the type was or was not figured, respectively, except where this line is enclosed by parentheses. Such parentheses declare the specimen to be an unfigured plastotype and the reference applies to the specimen from which the cast was made. A question mark following a figure citation indicates uncertainty that this figure was made from the specimen in our collection.

A species index is included to facilitate location of species-group names in the catalogue. Varieties are listed by both the varietal name and the next higher species-group name.

Definitions of type categories and apposite discussions of their use in paleontology were presented by Schenk *et al.* (1956:5-9) and Bell (1962:vii-viii). Their definitions and concepts are followed here.

CATALOGUE

PROTOZOA

Amphistegina californica Cushman and Hanna

Cushman and Hanna, 1927, p. 56, pl. 6, fig. 3, 4, 5.

Syntype; 68 (fig. 3), 726 (fig. 4), 727 (fig. 5); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Actinocyclus aster Woodring

Woodring, 1930, p. 152, pl. 14, fig. 4, pl. 16, fig. 1, 3, pl. 17, fig. 2.

Paratype; 332 (pl. 14, fig. 4), 333 (pl. 16, fig. 1), 334 (pl. 16, fig. 3), 335 (pl. 17, fig. 2); Eocene; 332-334: Canada de los Sauces; 335: Jalama Creek, both Santa Barbara Co., Calif.

Bulimina subacuminata Cushman and R. E. Stewart

Cushman, Stewart, and Stewart, 1930, p. 65.

Paratypes; 9, 710-716; Pliocene; Bear River, Humboldt Co., Calif.

Bulimina subcalva Cushman and K. C. Stewart

Cushman, Stewart, and Stewart, 1930, p. 65.

Paratypes; 8, 705-709; Pliocene; Scotia Bluffs, Humboldt Co., Calif.

Cibicides sandiegensis Cushman and Hanna

Cushman and Hanna, 1927, p. 55, pl. 6, fig. 1?, 2?.

Syntype; 67 (fig. 1?, 2?), 725 (fig. 1?, 2?); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Discocyclus californica Schenck

Schenck, 1929, p. 224, pl. 28, fig. 6, pl. 29, fig. 2.

Holotype; 75 (fig. 6); paratype; 76 (fig. 2); Eocene, 1¼ miles northeast New Almaden Mine, Santa Clara Co., Calif.

Discocyclusa psila Woodring

Woodring, 1930, p. 148, pl. 14, fig. 4, pl. 17, fig. 2.

Paratype; 332 (pl. 14, fig. 4), 335 (pl. 17, fig. 2), 336, 337, 388; Eocene; 332, 336, 337: Canada de los Sauces; 334: Jalama Creek, both Santa Barbara Co., Calif.

Elphidium fax barbarensis Nicol

Nicol, 1944, p. 178.

Paratype; 619; Pleistocene, Santa Barbara Formation; Bathhouse Beach, Santa Barbara, Santa Barbara Co., Calif.

Elphidium hughesi Cushman and Grant

Cushman and Grant, 1927, p. 75.

Paratype; 74, 732-740; Pliocene, Poncho Rico Formation; Pine Valley, Monterey Co., Calif.

Epistomina cocenica Cushman and Hanna

Cushman and Hanna, 1927, p. 53, pl. 5, fig. 4, 5.

Syntype; 63 (fig. 5), 723 (fig. 4); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Eponides mexicana (Cushman)

Cushman and Hanna, 1927, p. 54, pl. 5, fig. 8, 9?

Hypotype; 66 (fig. 8), 724 (fig. 9?); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Gaudryina convexa Cushman var. *sandiegensis* Cushman and Hanna

Cushman and Hanna, 1927, p. 50, pl. 4, fig. 1.

Holotype; 55; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Gyroidina soldanii d'Orbigny var. *octocamerata* Cushman and Hanna

Cushman and Hanna, 1927, p. 56, pl. 5, fig. 7.

Hypotype; 65; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Marginulina sp. ?

Cushman and Hanna, 1927, p. 51, pl. 4, fig. 5.

Hypotype; 59; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Nodosaria (Dentalina) communis (d'Orbigny)

Cushman and Hanna, 1927, p. 52, pl. 4, fig. 11?, 12.

Hypotype; 61 (fig. 12), 720 (fig. 11?); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Nodosaria (Dentalina) consobrina (d'Orbigny)

Cushman and Hanna, 1927, p. 52, pl. 4, fig. 7, 8.

Hypotype; 60 (fig. 7), 719 (fig. 8); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Nodosaria latejugata Gumbel

Cushman and Hanna, 1927, p. 52, pl. 5, fig. 1-3.

Hypotype; 62 (fig. 1), 721 (fig. 2), 722 (fig. 3); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Nonion cf. *umbilicatus* (Montagu)

Cushman and Hanna, 1927, p. 57, pl. 6, fig. 6.

Hypotype; 69; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Quinqueloculina triangularis d'Orbigny

Cushman and Hanna, 1927, p. 57, pl. 6, fig. 8?, 9?

Hypotype; 71 (fig. 8?, 9?), 29 (fig. 8?, 9?); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Robulus inornatus d'Orbigny

Cushman and Hanna, 1927, p. 51, pl. 4, fig. 4, 6.

Hypotype; 58 (fig. 4), 718 (fig. 6); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Robulus mexicanus (Cushman) var. *nudicostatus* (Cushman and Hanna)

Cushman and Hanna, 1927, p. 50, pl. 4, fig. 2?

Hypotype; 56; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Siphonina cf. *jacksonensis* Cushman and Applin

Cushman and Hanna, 1927, p. 53, pl. 5, fig. 6?

Hypotype; 64; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Textularia labiata Reuss, var.

Cushman and Hanna, 1927, p. 50, pl. 4, fig. 3.

Hypotype; 57; Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

Triloculina inornata d'Orbigny

Cushman and Hanna, 1927, p. 58, pl. 6, fig. 10, 11.

Hypotype; 70 (fig. 10), 728 (fig. 11); Eocene, Rose Canyon Formation; 3.5 miles north of La Jolla, San Diego Co., Calif.

COELENTERATA

Dendrophyllia hannibali Nomland

Nomland, 1916, p. 67.

Syntype; 926, 927; Oligocene, Lincoln Formation; 1.5 miles above Porter, Grays Harbor Co., Washington.

Oculina panzana Loel and Corey

Loel and Corey, 1932, p. 275.

Paratype; 801; Miocene, Vaqueros Formation; Carrizo Creek, west of the Carrizo ranch house, La Panza Mountains, San Luis Obispo Co., Calif.

Turbinolia clarki Quayle

Quayle, 1932, p. 100.

Paratype; 356, 357; Eocene, Domengine Formation; Parsons Peak, Fresno Co., Calif.

Turbinolia dickersoni Nomland

Quayle, 1932, p. 98, pl. 6, fig. 1-5.

Hypotype; 378 (fig. 3), 379 (fig. 1, 4), 380 (fig. 5), 381 (fig. 2); Eocene, Meganos Formation; branch of Salt Creek about 16 miles north of Coalinga, Fresno Co., Calif.

Turbinolia imbulata (Hanna)

Quayle, 1932, p. 103, pl. 6, fig. 11, 12, 15, 16.

Hypotype; 358 (fig. 15, 16), 359 (fig. 11, 12); Eocene, Rose Canyon Shales; 358: tributary to San Clemente Creek; 359: Rose Canyon, both San Diego Co., Calif.

Turbinolia pusillanima Nomland

Quayle, 1932, p. 101, pl. 6, fig. 9, 10.

Hypotype; 376; Eocene, Meganos Formation; T. 1 S., R. 1 E., Diablo Quadrangle, wash near creek below 1250-hill, Contra Costa Co., Calif.

Turbinolia sulcata Lamarck

Quayle, 1932, p. 109, pl. 6, fig. 13.

Hypotype; 382; Eocene; Parnes (Oise), France.

ANNELIDA

Serpula careyi Wiedey

Wiedey, 1928, p. 155, pl. 20, fig. 1.

Holotype; 42; Miocene, Vaqueros Formation; Junction of Cantinas Creek and Nacimiento River, San Luis Obispo Co., Calif. See: *Serpula coreyi* Wiedey.

Serpula coreyi Wiedey

Loel and Corey, 1932, pl. 65, fig. 9.

Holotype; 42; Miocene, Vaqueros Formation; Junction of Cantinas Creek and Nacimiento River, San Luis Obispo Co., Calif. See: *Serpula careyi* Wiedey

BRACHIOPODA

Eohemithiris alexi Hertlein and Grant

Hertlein and Grant, 1944, p. 55.

Paratype; 907, 908; Eocene; near headwaters of west branch of Agua Media Creek, McKittrick Quadrangle, Temblor Range, California.

Laqueus vancoveriensis digensis Hertlein and Grant

Hertlein and Grant, 1960, p. 97, pl. 20, fig. 16, 17.

Paratype; 349; Pliocene, San Diego Formation; Pacific Beach, San Diego, San Diego Co., Calif.

MOLLUSCA

Pelecypoda

Adontorhina cycilia Berry

Berry, 1947, p. 260 (6).

Paratype; 320, 321; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Amiantis callosa (Conrad)

Grant and Gale, 1931, p. 348, pl. 17, fig. 7, 9, 12, 13.

Hypotype; 162 (fig. 7), 163 (fig. 9), 165 (fig. 12), 166 (fig. 13); Pliocene, Pico Formation; 162: Holser Canyon; 163: west of Fernando Pass; 165-166: Elsmere Canyon, all Los Angeles Co., Calif.

Amiantis callosa (Conrad) variety *stalderi* (Clark)

Grant and Gale, 1931, p. 349, pl. 17, fig. 8a, 8b.

Hypotype; 164; Miocene; well core near Bakersfield, Kern Co., Calif.

Anatina (Raeta) *plicatella* (Lamarck) variety *longior* Grant and Gale

Grant and Gale, 1931, p. 408, pl. 23, fig. 1a, 1b.

Holotype; 192; Miocene; 4525 feet deep from oil well northwest of Bakersfield, Kern Co., Calif.

Anomia peruviana d'Orbigny

Grant and Gale, 1931, p. 240, pl. 12, fig. 2.

Hypotype; 118; Pleistocene, edge of mesa west of Newport, Los Angeles Co., Calif.

Anomia vaquerosensis Loel and Corey

Loel and Corey, 1932, p. 203.

Paratype; 782; Miocene, Vaqueros Formation; along NE-SW ridge west of mouth of Wiley Canyon, Ventura Co., Calif.

Antigona carrizocensis Loel and Corey

Loel and Corey, 1932, p. 221.

Paratype; 784-786; Miocene, Vaqueros Formation; "V" bend in Carrizo Creek, San Luis Obispo Co., Calif.

Antigona vaquerosensis Loel and Corey

Loel and Corey, 1932, p. 221.

Paratype; 787; Miocene, Vaqueros Formation; divide between Reliz and Vaqueros canyons, Monterey Co., Calif.

Arca (Andara) santaclarana Loel and Corey

Loel and Corey, 1932, p. 184.

Paratype; 776; Miocene, Vaqueros Formation; along NE-SW ridge west of mouth of Wiley Canyon, Ventura Co., Calif.

Arca (Andara) santana Loel and Corey

Loel and Corey, 1932, p. 185.

Paratype; 777; Miocene, Vaqueros Formation; west side of Plano Trabuco opposite south end of hill on plain, Santa Ana Mountains, Orange Co., Calif.

Arca (Arca) multicostata Sowerby variety *camuloensis* Osmont

Grant and Gale, 1931, p. 139, fig. 5a-c.

Hypotype; 85; Pliocene, Pico Formation; southeast of Pico Canyon, Los Angeles Co., Calif.

Arca (Barbatia) strongi Loel and Corey

Loel and Corey, 1932, p. 183.

Paratype; 775; Miocene, Vaqueros Formation; west side of Laguna Canyon on spur in large turn, Orange Co., Calif.

Arca galei Wiedey

Wiedey, 1928, p. 129, pl. 13, fig. 8.

Holotype; 21; Miocene; Temblor Formation; Benedict Canyon, Santa Monica Mtns., Los Angeles Co., Calif.

Arca hamelini Wiedey

Wiedey, 1928, p. 126, pl. 13, fig. 2.

Holotype; 18; Miocene, Vaqueros Formation; Little Sespe Creek, Ventura Co., Calif.

Arca impavida Wiedey

(Wiedey, 1928, p. 130, pl. 14, fig. 2, 3.)

Plastoholotype; 368, 369; Miocene, Temblor Formation; Barker's Ranch, Kern Co., Calif.

Arca lakei Wiedey

Wiedey, 1928, p. 127, pl. 13, fig. 4, 5.

Holotype; 19; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.

Arca (Navicula) terminumbonis Grant and Gale

Grant and Gale, 1931, p. 142, pl. 1, fig. 18a-c, 19a-c, 20a-c, 22.

Holotype; 79 (fig. 18a-c), paratype; 80 (fig. 19a-c), 81 (fig. 20a-c), 82 (fig. 22), 83, 741; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.

Arca perdisparis Wiedey

Wiedey, 1928, p. 131, pl. 13, fig. 6.

Holotype; 23; Miocene, Monterey Formation; Santa Cruz Mountains, Monterey Co., Calif.

Arca procumbens Wiedey

Wiedey, 1928, p. 132, pl. 13, fig. 10.

Syntype; 24; Miocene; 5 miles north of Yaquina Head, Lincoln Co., Oregon.

Arca rivulata Wiedey

Wiedey, 1928, p. 128, pl. 13, fig. 3.

Holotype; 20; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.

Arca sespensis Wiedey

Wiedey, 1928, p. 125, pl. 13, fig. 1.

Holotype; 17; Miocene, Vaqueros Formation; Little Sespe Creek, Ventura Co., Calif.

Arca vancouverensis Meek

(Meek, 1857, p. 40.)

Plastoparatype; 624; Cretaceous, Komooks Formation; Vancouver Island, British Columbia, Canada. See: *Parallelodon (Nanonavis) vancouverensis* (Meek)

Atrina stephensi Hanna

Hanna, 1926, p. 461, pl. 27, fig. 3, 4.

Holotype; 2; Pliocene, Imperial Formation; Coyote Mountain, Imperial Co., Calif.

- Basterotia* (*Basterotella*) *hertleini* Durham
Emerson and Hertlein, 1964, p. 355, fig. 4g-4j.
Hypotype; 811 (4g, 4h), 812 (4i), 813 (4j); Pliocene; Puerto Ballandra, Isla Carmen, Baja California, Mexico.
- Cardita* (*Carditamera*) *carpenteri* Lamy
Lamy, 1921, p. 264.
See: *Glans minuscula* Grant and Gale
- Cardita ventricosa* Gould
Grant and Gale, 1931, p. 272, pl. 13, fig. 9a, 9b, 11.
Hypotype; 124 (fig. 11), 125 (fig. 9a, 9b); 124: Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.; 125: Pleistocene, ridge between Casitas Creek and the sea, Ventura Co., Calif.
- Cardium arcumbona* Wiedey
Wiedey, 1928, p. 142, pl. 17, fig. 5.
Holotype; 31; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Cardium schencki* Wiedey
Wiedey, 1928, p. 143, pl. 17, fig. 3, 4.
Paratype; 32; Miocene, Temblor Formation; 2 miles south of Calabasas, Los Angeles Co., Calif.
- Chione juanensis* Loel and Corey
Loel and Corey, 1932, p. 223.
Paratype; 788; Miocene, Vaqueros Formation; near head of west branch of Anderson Creek, San Luis Obispo Co., Calif.
- Chione sechurana* Pilsbry and Olsson
Pilsbry and Olsson, 1935, p. 17.
Paratype; 580, 928; Pleistocene; Tric Trac Point, near Bayover, Bay of Sechura, Peru.
- Chione valentinei* Wiedey
Wiedey, 1929, p. 282, pl. 32, fig. 1.
Paratype; 53; Miocene, Temblor Formation (?); 2 miles south of Mayfield, Santa Clara Co., Calif.
- Chlamys* (*Argopecten*) *abietis* (E. K. Jordan and Hertlein)
Emerson and Hertlein, 1964, p. 354, fig. 4a-4e.
Hypotype; 805 (4a), 806 (4b), 807 (4c), 808 (4d), 809 (4e); 805, 808, 809: Pliocene, Isla San José; 806, 807: Pliocene; Isla Monserrate, both Baja California, Mexico.
- Clementia* (?) *elongata* Wiedey
Wiedey, 1928, p. 147, pl. 18, fig. 6.
Holotype; 35; Miocene; Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Clementia inequalis* Wiedey
Wiedey, 1928, p. 146, pl. 18, fig. 4.
Holotype; 34; Miocene, Vaqueros Formation; South Mountain, Ventura Co., Calif.
- Clementia* (*Compsoxyax*) *subdiaphana* Carpenter
Grant and Gale, 1931, p. 334, pl. 17, fig. 10a, 10b.
Hypotype; 167; Pleistocene, San Pedro Formation; Deadman Island, Los Angeles Co., Calif.
- Corbula* (*Corbula*) *gibbiformis* Grant and Gale
Grant and Gale, 1931, p. 420, pl. 19, fig. 4-6.
Holotype; 172 (fig. 5); paratype; 171 (fig. 4), 173 (fig. 6); Pliocene, Etchegoin Formation; 3951-52 feet deep in oil well, Kern Co., Calif.
- Corbula* (*Lentidium*) *luteola* Carpenter
Grant and Gale, 1931, p. 421, pl. 19, fig. 2, 7.
Hypotype; 168 (fig. 2), 169 (fig. 7); Pleistocene; south of Seacliff Station, Ventura Co., Calif.
- Crassatellites antillarum* (Reeves)
Grant and Gale, 1931, p. 271, pl. 13, fig. 7a, 7b.
Hypotype; 122; Pliocene; near Santa Rosalia, Baja California, Mexico.
- Cryptomya californica* (Conrad)
Grant and Gale, 1931, p. 417, pl. 21, fig. 7, 11.
Hypotype; 185 (fig. 7), 315 (fig. 11); Pleistocene; 185: southwest of Goleta, Santa Barbara Co., Calif.; 315: Barlow Canyon, Ventura Co., Calif.
- Cumingia lamellosa* Sowerby
Grant and Gale, 1931, p. 378, pl. 14, fig. 23, pl. 19, fig. 1.
Hypotype; 143; Pliocene; Maria Ygnacia Creek, Santa Barbara Co., Calif.
- Donax gouldii* Dall
Grant and Gale, 1931, p. 380, pl. 13, fig. 12.
Hypotype; 127; Pleistocene; west of Newport, Los Angeles Co., Calif.
- Dosinia* (*Dosinidia*) *margaritana* (Wiedey) *projecta* Loel and Corey
Loel and Corey, 1932, p. 217.
Paratype; 783; Miocene, Vaqueros Formation; head of north fork of Corral de Piedra Creek, about 5 miles east of San Luis Obispo, San Luis Obispo Co., Calif.

- Dosinia margaritana* Wiedey
Wiedey, 1928, p. 145, pl. 18, fig. 1, 3.
Holotype; 33; Miocene, Vaqueros Formation; 0.4 miles east of La Panza, San Luis Obispo Co., Calif.
- Dosinia ponderosa* (Gray) variety *jacalitosana* Arnold
Grant and Gale, 1931, p. 352, pl. 15, fig. 2a, 2b, 3.
Hypotype; 144 (fig. 2a, 2b), 145 (fig. 3); Pliocene, San Diego Formation; Balboa Park, San Diego, San Diego Co., Calif.
- Dosinia ponderosa* (Gray) variety *longidens* Grant and Gale
Grant and Gale, 1931, p. 353, pl. 15, fig. 4.
Holotype; 146; Miocene; core from oilwell northwest of Bakersfield, Kern Co., Calif.
- Glares minutula* Grant and Gale
Grant and Gale, 1931, p. 277, pl. 13, fig. 10a, 10b.
Holotype; 126; Pleistocene; Seacliff, Ventura Co., Calif.
See: *Cardita* (*Carditamera*) *carpenteri* Lamy
- Glycymeris septentrionalis* (Middendorff)
Grant and Gale, 1931, p. 134, pl. 1, fig. 21a-b.
Hypotype; 84; Pleistocene; ridge at northwest corner El Conejo land grant, Ventura Co., Calif.
- Irus lamellifer* (Conrad) variety *prelamellifer* Grant and Gale
Grant and Gale, 1931, p. 332, pl. 18, fig. 7.
Holotype; 157; Miocene; well core near Bakersfield, Kern Co., Calif.
- Laevicardium* (*Cerastoderma*) *corbis* (Martyn)
Grant and Gale, 1931, p. 307, pl. 19, fig. 17.
Hypotype; 176; Recent; Seven Mile Beach, San Mateo Co., Calif.
- Laevicardium* (*Nemocardium*) *centiflosum* (Carpenter)
Grant and Gale, 1931, p. 311, pl. 19, fig. 9, 10.
Hypotype; 174 (fig. 9), 175 (fig. 10); Pliocene, Etchegoin Formation; 3951-52 feet deep in oil well, Kern Co., Calif.
- Lucina* (Here) *excavata* Carpenter
Grant and Gale, 1931, p. 290, pl. 14, fig. 2, 5, 10.
Hypotype; 131 (fig. 2), 132 (fig. 3), 133 (fig. 10); Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Lucina* (*Miltha*) *xantusi* (Dall)
Grant and Gale, 1931, p. 291, pl. 14, fig. 20a, 20b.
Hypotype; 140a (fig. 20a, 20b), 140b; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Lucina* (*Myrtea*) *acutilineata* Conrad
Grant and Gale, 1931, p. 286, pl. 14, fig. 22a, 22b.
Hypotype; 141; Pleistocene; San Pedro, Los Angeles Co., Calif.
- Lucina* (*Myrtea*) *californica* Conrad
Grant and Gale, 1931, p. 285, pl. 14, fig. 15a, 15b, 21a, 21b.
Hypotype; 138 (fig. 15a, 15b), 142 (fig. 21a, 21b); 138; Pleistocene, San Pedro, Los Angeles Co., Calif.; 142; Pliocene, Santa Barbara, Santa Barbara Co., Calif.
- Lucina* (*Myrtea*) *nuttallii* Conrad
Grant and Gale, 1931, p. 288, pl. 14, fig. 18.
Hypotype; 139; Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Lucina* (*Myrtea*) *tenuisculpta* Carpenter variety *approximata* (Dall)
Grant and Gale, 1931, p. 289, pl. 14, fig. 8a, 8b.
Hypotype; 136; Pleistocene, San Pedro Formation; San Pedro, Los Angeles Co., Calif.
- Macoma balthica* (Linnaeus)
Grant and Gale, 1931, p. 371, pl. 14, fig. 6a, 6b, pl. 20, fig. 7a, 7b.
Hypotype; 134a (fig. 6a, 7a), 134b (fig. 6b, 7b); Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Macoma copelandi* Wiedey
Wiedey, 1928, pl. 149, pl. 19, fig. 2.
Holotype; 37; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Macoma moesta* (Deshayes) variety *acolata* Dall
Grant and Gale, 1931, p. 371, pl. 14, fig. 7.
Hypotype; 135; Pleistocene; near Goleta, Santa Barbara Co., Calif.
- Macoma nasuta* (Conrad)
Grant and Gale, 1931, p. 365, pl. 20, fig. 11a, 11b.
Hypotype; 178; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Macoma panzana* Wiedey
Wiedey, 1928, p. 150, pl. 19, fig. 1.
Holotype; 38; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Macoma secta* (Conrad)
Grant and Gale, 1931, p. 374, pl. 20, fig. 6a, 6b.
Hypotype; 177; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Macoma sespeensis Loel and Corey

Loel and Corey, 1932, p. 228.

Paratype; 789; Miocene, Vaqueros Formation; one mile up Little Sespe Creek from junction with Sespe Creek, Ventura Co., Calif.

Macrocallista stantoni Waring

Waring, 1917, p. 77.

Paratype; 623; Eocene, Martinez Formation; Martinez area, Simi Hills, Ventura Co., Calif.

Macra (Macra) orthomorpha Grant and Gale

Grant and Gale, 1931, p. 391, pl. 23, fig. 2a-2c, 6, 7.

Holotype; 193 (fig. 2a-2c); paratype; 194 (fig. 6), 195 (fig. 7), 746 (fig. 2b, *pars*, "fragment of another specimen"); Pliocene, Etchegoin Formation; oil well near Tipton, Tulare Co., Calif.

Macra (Spisula) albaria Conrad

Grant and Gale, 1931, p. 395, pl. 23, fig. 3a, 3b.

Hypotype; 189; Miocene; 4575 feet deep in oil well northwest of Bakersfield, Kern Co., Calif.

Macra (Spisula) catilliformis (Conrad)

Grant and Gale, 1931, p. 398, pl. 23, fig. 4, 10.

Hypotype; 196 (fig. 4), 197 (fig. 10); Pliocene, Etchegoin Formation; oil well 3229-3230 feet deep, northwest of Bakersfield, Kern Co., Calif.

Mya (Mya) arenaria Linnaeus variety *japonica* Jay

Grant and Gale, 1931, p. 412, pl. 21, fig. 13.

Hypotype; 188; Pliocene, Etchegoin Formation; 2877 feet deep in oil well, Kern Co., Calif.

Mya (Platyodon) cancellata Conrad

Grant and Gale, 1931, p. 415, pl. 24, fig. 3a, 3b.

Hypotype; 202; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Nucula (Acila) sp. Grant and Gale

Grant and Gale, 1931, p. 115, text-fig. 4.

Hypotype; 374; Pliocene; 1¼ miles west of San Martinez Grande Canyon, Los Angeles Co. and Ventura Co., Calif., boundary line.

Nucula (Acila) gettysburgensis Reagan

Grant and Gale, 1931, p. 113, text-fig. 1.

Hypotype; 375; Oligocene; Twin Rivers Shales; one mile west of the mouth of West Twin River, Clallam Co., Wash.

Nucula (Acila) semiostrata Grant and Gale

Grant and Gale, 1931, p. 113, text-fig. 2a, 2b, 3a, 3b.

Holotype; 370 (fig. 2a, 2b); paratype; 371 (fig. 3a, 3b), 372, 373; Pliocene; 1¼ miles west of San Martinez Grande Canyon, Los Angeles Co. and Ventura Co., Calif., boundary line.

Nucula (Ennucula) birchi Keen

Keen, 1943, p. 41.

Paratype; 611, 933; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

Nucula (Ennucula) microsperma Berry

Berry, 1947, p. 258 (4).

Paratype; 318, 319; Pleistocene, Lomita Formation; 2nd and Pacific Streets, San Pedro, Los Angeles Co., Calif.

Nuculana taphria (Dall)

Grant and Gale, 1931, p. 121, pl. 1, fig. 8, 9.

Hypotype; 77 (fig. 8), 78 (fig. 9); 77: Pliocene; Holser Canyon, Los Angeles Co., Calif.; 78: Pleistocene; near Goleta, Santa Barbara Co., Calif.

Ostrea angelica Rochebrune

Emerson and Hertlein, 1964, p. 353, fig. 3a, 3b.

Hypotype; 802; ?Pliocene; Isla Angel de la Guarda, Baja California, Mexico.

Ostrea ashleyi Hertlein

Hertlein, 1934, p. 1.

Paratype; 429; Miocene, Temblor Formation; Kern Co., Calif.

Ostrea eldridgei (Arnold) *inezana* Loel and Corey

Loel and Corey, 1932, p. 189.

Paratype; 779; Miocene, Vaqueros Formation; El Jaro Creek, Santa Ynez Mountains, Santa Barbara Co., Calif.

Ostrea haleyi Hertlein

(Hertlein, 1933, p. 277, pl. 18, fig. 5, 6.)

Plastoholotype; 425 (fig. 5), 426 (fig. 6); paratype 427; Eocene; Santa Cruz Island, Calif.

Ostrea howelli Wiedey

Wiedey, 1928, p. 135, pl. 15, fig. 1, 2.

Holotype; 26; Miocene; 5½ miles northeast of Wheeler's Hot Springs, Ventura Co., Calif.

Ostrea tayloriana Gabb

(Gabb, 1869, p. 34, pl. 12, fig. 60, 60a.)

Plastoholotype; 190, 742; Eocene; San Marcos Pass, Santa Barbara Co., Calif.

Ostrea vaquerosensis Loel and Corey

Loel and Corey, 1932, p. 192.

Paratype; 780; Miocene, Vaqueros Formation; 2.6 miles north 21 degrees east of Abalone Point, Orange Co., Calif.

Ostrea venturana Loel and Corey

Loel and Corey, 1932, p. 193.

Paratype; 781; Miocene, Vaqueros Formation; ridge north of Coyote Creek fork of Ventura River, Ventura Co., Calif.

Ostrea vespertina Conrad

Grant and Gale, 1931, p. 152, pl. 12, fig. 1a, 1b.

Hypotype; 116; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Pandora punctata Conrad

Grant and Gale, 1931, p. 262, pl. 13, fig. 2a, 2b.

Hypotype; 121; Pleistocene, San Pedro Formation; Palos Verdes, Los Angeles Co., Calif.

Panope (Panope) generosa Gould

Grant and Gale, 1931, p. 424, pl. 21, fig. 12a, 12b.

Hypotype; 187; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Panope tenuis Wiedey

Wiedey, 1928, p. 154, pl. 20, fig. 4.

Holotype; 41; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.

Paphia restorationensis Frizzell

Frizzell, 1930, p. 120.

Holotype; 386; Pleistocene; near Port Blakely, Jefferson Co., Wash.

See: *Venerupis (Protothaca) restorationensis* (Frizzell)

Parallelodon (Nanonavis) vancouverensis (Meek)

Reinhart, 1937, p. 171.

See: *Arca vancouverensis* Meek

Pecten (Aequipecten) andersoni Arnold

Grant and Gale, 1931, p. 202, pl. 4, fig. 4, 5.

Hypotype; 93 (fig. 4), 94 (fig. 5); Miocene; Barker's Ranch, Kern Co., Calif.

Pecten (Aequipecten) deserti Conrad, type variety

Grant and Gale, 1931, p. 212, pl. 5, fig. 3.

Hypotype; 98; Pliocene, Carrizo Creek beds, Imperial Co., Calif.

Pecten (Aequipecten) deserti Conrad variety *invalidus* Hanna

Grant and Gale, 1931, p. 213, pl. 5, fig. 5a-c, 6a-c.

Hypotype; 100 (fig. 5a-c), 101 (fig. 6a-c); Pliocene, Pico Formation; between Holser and San Martinez Grande Canyons, Los Angeles Co., Calif.

Pecten (Aequipecten) discus Conrad

Grant and Gale, 1931, p. 200, pl. 4, fig. 7.

Hypotype; 96; Miocene, Santa Margarita Formation; 4655 foot depth in Ansolabehere No. 1 oil well, northwest of Bakersfield, Kern Co., Calif.

Pecten (Aequipecten) latiauratus Conrad variety *monotimeris* Conrad

Grant and Gale, 1931, p. 204, pl. 4, fig. 3, 6.

Hypotype; 92 (fig. 3), 95 (fig. 6); Pleistocene; 1/2 mile south of Southern Pacific station at Seacliff, Ventura Co., Calif.

Pecten (Aequipecten) percarus Hertlein

Hertlein, 1925a, p. 13.

Paratype; 630; Pliocene, Salada Formation; northwest of Elephant Mesa west of Arroyo, Scammons Lagoon Quadrangle, Baja California, Mexico.

Pecten (Aequipecten) purpuratus Lamarck variety *callidus* Hertlein

Grant and Gale, 1931, p. 211, pl. 5, fig. 4.

Hypotype; 99; Pliocene, Pico Formation; west of Fernando Pass, Los Angeles Co., Calif.

Pecten (Aequipecten) purpuratus Lamarck variety *subdolos* Hertlein

Grant and Gale, 1931, p. 211, pl. 5, fig. 1.

Hypotype; 97; Pliocene, Pico Formation; summit of ridge over Fernando Pass railroad tunnel, Los Angeles Co., Calif.

Pecten (Camptonectes) harfordus Davis

Davis, 1913, p. 456.

Paratype; 634, 938, 939; Jurassic, San Luis Formation; 6 miles north of Port Harford, San Luis Obispo Co., Calif.

Pecten (Chlamys) crici Wiedey

Wiedey, 1928, p. 137, pl. 16, fig. 1.

Holotype; 27; Miocene, Vaqueros Formation; South Mountain, Ventura Co., Calif.

Pecten (Chlamys) hodgei Hertlein

Hertlein, 1925b, p. 42.

Paratype; 632; Miocene, Santa Margarita Formation; Coalinga region, Fresno Co., Calif.

- Pecten (Janira) bellus* (Conrad) variety *coalingaensis* Arnold
Grant and Gale, 1931, p. 227, pl. 2, fig. 2.
Hypotype; 86; Pliocene, Pico Formation; southeast of Pico Canyon, Los Angeles Co., Calif.
- Pecten (Janira) bellus* (Conrad) variety *hemphilli* Dall
Grant and Gale, 1931, p. 226, pl. 3, fig. 1a, 1b.
Hypotype; 88a (fig. 1a), 88b (fig. 1b); Pliocene, San Diego Formation; Pacific Beach, San Diego, San Diego Co., Calif.
- Pecten (Janira) bellus* (Conrad) variety *slevini* Dall and Ochsner
Grant and Gale, 1931, p. 227, pl. 2, fig. 3.
Hypotype; 87; Pliocene; north of Santa Clara Valley and east of San Martinez Chiquito Canyon, Los Angeles Co., Calif.
- Pecten (Janira) stearnsii* Dall variety *bakeri* Hanna and Hertlein
Grant and Gale, 1931, p. 224, pl. 4, fig. 1a, 1b.
Hypotype; 91; Pliocene, Santa Rosalia, Territorio de Sur de Baja California, Mexico.
- Pecten (Janira) stearnsii* Dall variety *diegensis* Dall
Grant and Gale, 1931, p. 223, pl. 3, fig. 4.
Hypotype; 89; Pliocene, Pico Formation?; Smith Canyon, Ventura Co., Calif.
- Pecten (Janira) stearnsii* Dall variety *stearnsii*, s. s.
Grant and Gale, 1931, p. 223, pl. 3, fig. 2b (not 2a).
Hypotype; 90; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Pecten (Lyropecten) estrellanus* (Conrad)
Grant and Gale, 1931, p. 185, pl. 8, fig. 4.
Hypotype; 106; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Pecten (Lyropecten) estrellanus* (Conrad) variety *cerrosensis* Gabb
Grant and Gale, 1931, p. 187, pl. 8, fig. 1a, 1b, 2a, 2b, pl. 9, fig. 2.
Hypotype; 107 (pl. 8, fig. 1a, 1b), 108 (pl. 8, fig. 2a, 2b), 109 (pl. 9, fig. 2); Pliocene, Los Angeles Co., Calif.; 107: Pico Formation, southeast of Pico Canyon; 108: Pico Formation, Holser Canyon; 109: ridge north of Junction of Tomsley and Wiley Canyons.
- Pecten (Pallium) swiftii* Bernardi
Grant and Gale, 1931, p. 171, pl. 10, fig. 2, 5.
Hypotype; 110 (fig. 2), 113 (fig. 5); Pliocene, Pico Formation, Holser Canyon; Los Angeles Co., Calif.
- Pecten (Pallium) swiftii* Bernardi variety *etchegoini* Anderson
Grant and Gale, 1931, p. 173, pl. 10, fig. 3a, 3b.
Hypotype; 111; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Pecten (Patinopecten) caurinus* Gould
Grant and Gale, 1931, p. 194, pl. 6, fig. 4.
Hypotype; 105; Pliocene, Purisima Formation; Purisima Creek, San Mateo Co., Calif.
- Pecten (Patinopecten) healeyi* Arnold
Grant and Gale, 1931, p. 196, pl. 6, fig. 2a, 2b.
Hypotype; 103a (fig. 2a), 103b (fig. 2b); Pliocene, San Diego Formation; Pacific Beach, San Diego, San Diego Co., Calif.
- Pecten (Patinopecten) healeyi* Arnold variety *lobri* Hertlein
Grant and Gale, 1931, p. 197, pl. 6, fig. 1a, 1b.
Hypotype; 102; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Pecten (Patinopecten) marquerensis* (Durham)
Emerson and Hertlein, 1964, fig. 4f.
Hypotype; 810; Pliocene; Isla San José, Baja California, Mexico.
- Pecten (Patinopecten) purismaensis* Arnold
Grant and Gale, 1931, p. 194, pl. 6, fig. 3.
Hypotype; 104; Pliocene, Purisima Formation; mouth of San Gregorio Creek, San Mateo Co., Calif.
- Pecten (Pecten) beringianus* Middendorff
Grant and Gale, 1931, p. 165, pl. 11, fig. 2.
Hypotype; 114; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.
- Pecten (Pecten) islandicus* Muller variety *jordani* Arnold
Grant and Gale, 1931, p. 164, pl. 11, fig. 4.
Hypotype; 115; Pliocene; Packard's Hill, Santa Barbara, Santa Barbara Co., Calif.
- Pecten (Plagiectenium) cristobalensis* Hertlein
Hertlein, 1925a, p. 19.
Paratype; 631; Pliocene, Salada Formation; 3 miles southeast of Turtle Bay, San Cristobal Bay Quadrangle, Baja California, Mexico.
- Pecten (Plagiectenium) hakei* Hertlein
Hertlein, 1925a, p. 18.
Paratype; 638; Pliocene; Ballenas Quadrangle, Baja California, Mexico.

Pecten (Pseudamysium) vancouverensis fernandoensis Hertlein

Hertlein, 1925b, p. 43.

Paratype; 635; Pliocene, Fernando Formation; on Ventura River, 1.5 miles north of Ventura, Ventura Co., Calif.

Pecten vanwinkleae Clark

Clark, 1925, p. 82.

Paratype; 636; Oligocene, Lincoln Formation; along Porter Creek about ¾ miles above Porter, Grays Harbor Co., Wash.

Pedalion panzana Loel and Corey

Loel and Corey, 1932, p. 187.

Paratype; 778; Miocene, Vaqueros Formation; branch of Carrizo Creek about 100 yards west of Carrizo ranch house, La Panza Mountains, San Luis Obispo Co., Calif.

Petricola carduioides (Conrad)

Grant and Gale, 1931, p. 355, pl. 13, fig. 14a, 14b.

Hypotype; 128; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Pholadidea (Pholadidea) penita (Conrad)

Grant and Gale, 1931, p. 434, pl. 24, fig. 1a, 1b.

Hypotype; 200; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Pholadomya kernensis Wiedey

(Wiedey, 1928, p. 141, pl. 17, fig. 1, 2.)

Plastoholotype; 191, 743-745; Miocene, Temblor Formation; north of Poso Creek, Kern Co., Calif.

Pholas (Zirfaea) gabbi (Tryon)

Grant and Gale, 1931, p. 432, pl. 24, fig. 2.

Hypotype; 201; Pliocene, Etchegoin Formation; 3900-18 feet deep in oil well near McFarland, Kern Co., Calif.

Pinna latramia Hanna

Hanna, 1926, p. 476.

Paratype; 1; Pliocene, Imperial Formation; Coyote Mountain, Imperial Co., Calif.

Pododesmus macroschisma (Deshayes)

Grant and Gale, 1931, p. 241, pl. 12, fig. 3.

Hypotype; 120; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Pteria jordani Wiedey

Wiedey, 1928, p. 134, pl. 14, fig. 4.

Holotype; 25; Miocene, Temblor Formation; 2 miles south of Calabasas, Los Angeles Co., Calif.

Sanguinolaria (Nuttallia) oreutti Dall

Dall, 1921, p. 17.

Syntype; 940-950; Pleistocene; San Quintin Bay, Baja California, Mexico.

Saxidomus nuttalli Conrad variety *giganteus* (Deshayes)

Grant and Gale, 1931, p. 342, pl. 18, fig. 4, 10.

Hypotype; 156 (fig. 4), 158 (fig. 10); 156: Pleistocene, 1 to 1¼ miles west of Goleta Point, Santa Barbara Co., Calif.; 158: Pliocene, 100 yards west of the bathhouse, Santa Barbara, Santa Barbara Co., Calif.

Schizothaerus nuttalli (Conrad)

Grant and Gale, 1931, p. 404, pl. 22, fig. 6a, 6b, pl. 23, fig. 8a, 8b, 9.

Hypotype; 198 (pl. 23, fig. 8a, 8b), 199 (pl. 23, fig. 9), 330 (pl. 22, fig. 6a, 6b); 198, 199: Pleistocene, southwest of Goleta, Santa Barbara Co., Calif.; 330: Pliocene, Purisima Formation, Pt. Año Nuevo, San Mateo Co., Calif.

Semele decisa (Conrad)

Grant and Gale, 1931, p. 376, pl. 14, fig. 13a, 13b.

Hypotype; 137; Pleistocene, San Pedro Formation; San Pedro, Los Angeles Co., Calif.

Semele verrucosa Mörch

Emerson and Hertlein, 1964, p. 359, fig. 3i, 3j.

Hypotype; 803; Pleistocene; Isla Coronados, Baja California, Mexico.

Siliqua cf. patula (Dixon)

Grant and Gale, 1931, p. 924, pl. 21, fig. 9.

Hypotype; 186; Pliocene, Etchegoin Formation; oil well near McFarland, Kern Co., Calif.

Siliqua lucida (Conrad)

Grant and Gale, 1931, p. 389, pl. 21, fig. 6.

Hypotype; 184; Pliocene, Etchegoin Formation; 3000-18 feet deep in well near McFarland, Kern Co., Calif.

Solen sicarius Gould

Grant and Gale, 1931, p. 385, pl. 21, fig. 4.

Hypotype; 183; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Sphaerium (Amesoda) rogersi Hannibal

Hannibal, 1913, p. 131.

Paratype; 633; Eocene, Tejon Formation; ¼ mile above Carnegie Pottery in Western Pacific Railway cut, Corral Hollow, Tesla, Alameda Co., Calif.

- Spisula abbotti* Wiedey
Wiedey, 1928, p. 151, pl. 19, fig. 4, 5.
Holotype; 39; Miocene, Temblor Formation; 2 miles northwest of powerhouse at mouth of Kern Canyon, Kern Co., Calif.
- Spisula granti* Wiedey
Wiedey, 1928, p. 152, pl. 20, fig. 2, 3.
Holotype; 40; Miocene, Vaqueros Formation; Vaqueros Creek, Monterey Co., Calif.
- Spondylus inezana* Wiedey
Wiedey, 1928, p. 139, pl. 16, fig. 2, 3.
Holotype; 29; Miocene, Vaqueros Formation; Head of Wiley Canyon, Ventura Co., Calif.
- Spondylus perrini* Wiedey
Wiedey, 1928, p. 138, pl. 17, fig. 6, 7.
Holotype; 28; Miocene, Vaqueros Formation; Head of Wiley Canyon, Ventura Co., Calif.
- Tagelus californianus* (Conrad)
Grant and Gale, 1931, p. 384, pl. 21, fig. 2a, 2b, 3.
Hypotype; 181 (fig. 2a, 2b), 182 (fig. 3); Pleistocene; San Pedro, Los Angeles Co., Calif.
- Tellina bodegensis* Hinds
Grant and Gale, 1931, p. 362, pl. 20, fig. 13.
Hypotype; 180; Pleistocene; west of Newport, Los Angeles Co., Calif.
- Tellina idae* Dall
Grant and Gale, 1931, p. 358, pl. 20, fig. 12.
Hypotype; 179; Pliocene, Pico Formation; above Newhall railroad tunnel, Los Angeles Co., Calif.
- Tellina oldroydi* Wiedey
Wiedey, 1928, p. 148, pl. 19, fig. 3.
Holotype; 36; Miocene, Temblor Formation; 2 miles south of Calabasas, Los Angeles Co., Calif.
- Thracia (Thracia) trapezoides* Conrad
Grant and Gale, 1931, p. 257, pl. 13, fig. 8.
Hypotype; 123; Miocene; 2 or 3 miles south of Mayfield, Santa Clara Co., Calif.
- Thyasira bisecta* (Conrad) variety *nipponica* Yabe and Nomura
Grant and Gale, 1931, pl. 13, fig. 15.
Hypotype; 129; Pliocene or Pleistocene, Kawabata Series; Japan.
- Tivela gastoensis* Clark
Clark, 1925, p. 93.
Paratype; 627; Oligocene; county quarry, Scroggins Canyon, Gaston, Washington Co., Oregon.
- Tivela stultorum* (Mawe)
Grant and Gale, 1931, p. 340, pl. 19, fig. 3a, 3b.
Hypotype; 170; Pleistocene; west of Newport, Los Angeles Co., Calif.
- Venerupis (Protothaca) restorationensis* (Frizzell)
Frizzell, 1931, p. 321, pl. 22, fig. 2-4.
Holotype; 386; Pleistocene; near Port Blakely, Jefferson Co., Wash.
See: *Paphia restorationensis* Frizzell
- Venerupis (Protothaca) staminea* (Conrad)
Grant and Gale, 1931, p. 329, pl. 18, fig. 1a, 1b, 2a, 2b.
Hypotype; 153 (fig. 1a, 1b), 154 (fig. 2a, 2b); Pleistocene; beach southwest of Goleta, Santa Barbara Co., Calif.
- Venerupis (Protothaca) staminea* (Conrad) variety *runderata* (Deshayes)
Grant and Gale, 1931, p. 331, pl. 18, fig. 3a, 3b.
Hypotype; 155; Pleistocene; 1 to 1¼ miles west of Goleta Point, Santa Barbara Co., Calif.
- Venus (Chione) elsmereensis* (English)
Grant and Gale, 1931, p. 319, pl. 16, fig. 6a, 6b, 7.
Hypotype; 151 (fig. 6a, 6b), 152 (fig. 7); Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Venus (Chione) securis* Shumard variety *fernandoensis* (English)
Grant and Gale, 1931, p. 321, pl. 17, fig. 4a, 4b, 5, 6.
Hypotype; 159 (fig. 4a, 4b), 160 (fig. 5), 161 (fig. 6); Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Venus (Chione) succincta* Valenciennes
Grant and Gale, 1931, p. 321, pl. 16, fig. 1a, 1b, 2a, 2b, 3, 4.
Hypotype; 147 (fig. 1a, 1b), 148 (fig. 2a, 2b), 149 (fig. 3), 150 (fig. 4); Pleistocene; 5 miles ENE of Newport Beach, Orange Co., Calif.

Gastropoda

- Acanthina spirata* (Blainville)
Grant and Gale, 1931, p. 720, pl. 32, fig. 6, 7.
Hypotype; 293 (fig. 6), 294 (fig. 7); Pleistocene; 293: San Pedro, Los Angeles Co., Calif.; 294: Sexton Canyon, Ventura Co., Calif.

Acmaea instabilis (Gould)

Grant and Gale, 1931, p. 813, pl. 32, fig. 32.

Hypotype; 313; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Acmaea lepsima Berry

Berry, 1940, p. 9.

Paratype; 353, 354, 355; Pleistocene; Hilltop Quarry, San Pedro, Los Angeles Co., Calif.

Acteon (*Rictaxis*) *painei* Dall variety *grandior* Grant and Gale

Grant and Gale, 1931, p. 444, pl. 24, fig. 12.

Holotype; 208; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Admete modesta (Carpenter)

Grant and Gale, 1931, p. 622, pl. 27, fig. 5.

Hypotype; 267; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.

Amphissa columbiana Dall

Grant and Gale, 1931, p. 701, pl. 26, fig. 39.

Hypotype; 250; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Amphissa versicolor Dall

Grant and Gale, 1931, p. 702, pl. 26, fig. 53.

Hypotype; 259; Pleistocene; California State Highway 1500 feet north of Rincon Creek, Santa Barbara Co., Calif.

Architectonica compressa Wiedey

Wiedey, 1928, p. 109, pl. 9, fig. 1, 2.

Holotype; 12; Miocene, Temblor Formation; 2 miles southeast of El Modena, Orange Co., Calif.

Architectonica nobilis Bolten variety *discus* Grant and Gale

Grant and Gale, 1931, p. 786, pl. 32, fig. 27.

Holotype; 308; Pliocene?; one mile southwest of Yuha drill hole, south of Dixieland, Imperial Co., Calif.

Astraea (*Pachypoma*) *inaequalis* (Martyn)

Grant and Gale, 1931, p. 820, pl. 31, fig. 4a, 4b.

Hypotype; 284; Pliocene; Bath-House Beach, Santa Barbara, Santa Barbara Co., Calif.

Astraea (*Pomaulax*) *gradata* Grant and Gale

Grant and Gale, 1931, p. 818, pl. 31, fig. 1a, 1b, 3a, 3b, 5, 8, 9.

Holotype; 286 (fig. 8); paratype; 282 (fig. 1a, 1b), 283 (fig. 3a, 3b), 285 (fig. 5), 287 (fig. 9);

Pliocene, Pico Formation; 282, 285, 287: Holser Canyon; 283: west of Fernando Pass; 286: between Pico Canyon and Fernando Pass; all Los Angeles Co., Calif.

Balcis (*Balcis*) *clavella* Berry

Berry, 1954, p. 5.

Paratype; 413; Pleistocene; Long Wharf Canyon, Santa Monica, Los Angeles Co., Calif.

Balcis (*Balcis*) *tersa* Berry

Berry, 1954, p. 7.

Paratype; 395, 396, 397; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Balcis conchita Keen

Keen, 1943, p. 43.

Paratype; 617, 936; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

Balcis (*Vitreolina*) *ebricanus* Berry

Berry, 1954, p. 11.

Paratype; 410, 411, 412; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Balcis (*Vitreolina*) *incallida* Berry

Berry, 1954, p. 10.

Paratype; 404-409; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Balcis (*Vitreolina*) *obstipa* Berry

Berry, 1954, p. 8.

Paratype; 398, 399, 400, 401, 402, 403; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Bathytoma clarkiana Rivers

Rivers, 1913, p. 29, 2 figures on unnumbered plate.

Syntypes; 10 (figured on left side of plate), 11 (figured on right side of plate); age and locality uncertain.

Bitium (*Lirobittium*) *asperum* (Gabb) variety *dilatatum* Grant and Gale

Grant and Gale, 1931, p. 760, pl. 24, fig. 14.

Holotype; 210; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Bitium (*Semibittium*) *rugatum* Carpenter

Grant and Gale, 1931, p. 762, pl. 24, fig. 8.

Hypotype; 205; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Calliostoma canaliculatum (Martyn)

Grant and Gale, 1931, p. 833, pl. 32, fig. 23.

Hypotype; 306; Pleistocene; San Pedro, Los Angeles Co., Calif.

- Calliostoma gemmulatum* Carpenter
Grant and Gale, 1931, p. 835, pl. 32, fig. 21.
Hypotype; 305; Pleistocene; one half mile south of Seacliff Station, Ventura Co., Calif.
- Calyptrea mamillaris* Broderip
Grant and Gale, 1931, p. 794, pl. 32, fig. 24a, 24b.
Hypotype; 307; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Cancellaria clavata* Sowerby
Grant and Gale, 1931, p. 615, pl. 27, fig. 2.
Hypotype; 264; Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Cancellaria hemphilli* Dall
Grant and Gale, 1931, p. 621, pl. 27, fig. 3, 15a, 15b.
Hypotype; 265 (fig. 3), 272 (fig. 15a, 15b); Pliocene; 265: Pico Formation, Holser Canyon, Los Angeles Co., Calif.; 272: between Pico Canyon and Fernando Pass, Los Angeles Co., Calif.
- Cancellaria obesa* Sowerby variety *planospira* Grant and Gale
Grant and Gale, 1931, p. 613, pl. 27, fig. 4.
Holotype; 266; Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Cancellaria tritonidea* Gabb variety *fernandoensis* Arnold
Grant and Gale, 1931, p. 618, pl. 27, fig. 1.
Hypotype; 263; Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Cantharus fortis* (Carpenter)
Grant and Gale, 1931, p. 647, pl. 28, fig. 2.
Hypotype; 273; Pleistocene; Santa Paula Creek, Ventura Co., Calif.
- Cantharus humerosus* (Gabb)
Grant and Gale, 1931, p. 647, pl. 28, fig. 3.
Hypotype; 274; Pliocene; between Pico Canyon and Fernando Pass, Los Angeles Co., Calif.
- Cerithidea californica* (Haldeman)
Grant and Gale, 1931, p. 763, pl. 24, fig. 6, 7.
Hypotype; 203 (fig. 6), 204 (fig. 7); Pleistocene; San Pedro, Los Angeles Co., Calif.
- "Cerithium" simplicius* Grant and Gale
Grant and Gale, 1931, p. 757, pl. 24, fig. 11.
Holotype; 207; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Chicoreus (Murithais) wilkesanus* (Anderson)
Grant and Gale, 1931, p. 730, pl. 32, fig. 12.
Hypotype; 298; Miocene; oil well northwest of Bakersfield, Kern Co., Calif.
- Chrysallida rotundomontana* Keen
Keen, 1943, p. 43.
Paratype; 610; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.
- Clathurella comradiana* Gabb
Grant and Gale, 1931, p. 606, pl. 26, fig. 11.
Hypotype; 236; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.
- Clathurella (Glyphostoma) tridesmia* Berry
Berry, 1941, p. 8.
Paratype; 384, 385, 393; Pleistocene; "Hilltop Quarry"; San Pedro, Los Angeles Co., Calif.
- Clavus (Clathrodrillia) coalingensis* (Arnold)
Grant and Gale, 1931, p. 580, pl. 26, fig. 14a, 14b, 15.
Hypotype; 232 (fig. 14a, 14b), 233 (fig. 15); Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Clavus (Crassispira) sp.*
Grant and Gale, 1931, p. 582, pl. 26, fig. 10.
Hypotype; 231; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Clavus (Cymatosyrinx) pallidus* (Sowerby)
Grant and Gale, 1931, p. 576, pl. 26, fig. 16a, 16b, 17.
Hypotype; 234 (fig. 16a, 16b), 235 (fig. 17); Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Conus californicus* Hinds
Grant and Gale, 1931, p. 472, pl. 24, fig. 21.
Hypotype; 216; Pleistocene; Santa Paula Quadrangle, Ventura Co., Calif.
- Conus californicus fossilis* Oldroyd
Oldroyd, T. S., 1921, p. 116.
Paratype; 361, 362; Pleistocene; San Pedro, Los Angeles Co., Calif.
- Conus juanensis* Wiedey
Wiedey, 1928, p. 123, pl. 9, fig. 3.
Holotype; 16; Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Conus oweniana* (Anderson) *inezanus* Loel and Corey
Loel and Corey, 1932, p. 237.
Paratype; 794; Miocene, Vaqueros Formation; 2.5 miles southwest of Buellton, Santa Barbara Co., Calif.

- Crepidula onyx* Sowerby
Grant and Gale, 1931, p. 790, pl. 32, fig. 34.
Hypotype; 314; Pliocene, Pico Formation; Canada de Aliso, Ventura Co., Calif.
- Cylichna* ? *loismartinae* Keen
Keen, 1943, p. 44.
Paratype; 608; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.
- Cylichna temblorensis* Keen
Keen, 1943, p. 44.
Paratype; 609, 930, 931, 932; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.
- Cypraea spadicea* Swainson
Grant and Gale, 1931, p. 752, pl. 27, fig. 13.
Hypotype; 270; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Drillia merriami* Arnold
(Arnold, 1903, p. 207, pl. 8, fig. 7.)
Plastoholotype; 637; Pleistocene, San Pedro Formation; Deadman Island, San Pedro, Los Angeles Co., Calif.
- Epitonium (Opalia) varicostatum* (Stearns)
Grant and Gale, 1931, p. 853, pl. 24, fig. 20.
Hypotype; 215; Pliocene, San Diego Formation; Pacific Beach, San Diego Co., Calif.
- Ferminoscala whitei* Keen
Keen, 1943, p. 46.
Paratype; 607, 929; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.
- Ficus (Trophosyon) ocoyana* (Conrad)
Grant and Gale, 1931, p. 743, pl. 30, fig. 11.
Hypotype; 281; Miocene; southwest of Mayfield, Santa Clara Co., Calif.
- Ficus (Trophosyon) ocoyana* (Conrad) variety *contignata* Grant and Gale
Grant and Gale, 1931, p. 749, pl. 29, fig. 1a, 1b, pl. 30, fig. 2, 4, 9a, 9b.
Holotype; 4 (pl. 29, fig. 1a, 1b, pl. 30, fig. 2); paratype; 278 (pl. 30, fig. 4), 279 (pl. 30, fig. 9a, 9b); Pliocene, Pico Formation; 4, 279; Elsmere Canyon; 278: south of Humphrey's Station; both Los Angeles Co., Calif.
- Ficus (Trophosyon) ocoyana* (Conrad) variety *ruginodosa* Grant and Gale
Grant and Gale, 1931, p. 746, pl. 29, fig. 2a, 2b, pl. 30, fig. 10a, 10b.
Holotype; 3 (pl. 29, fig. 2a, 2b); paratype (pl. 30, fig. 10a, 10b); Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Forreria magister* (Nomland)
Grant and Gale, 1931, p. 727, pl. 27, fig. 14a, 14b.
Hypotype; 271; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Fusinus barbarensis* (Trask)
Grant and Gale, 1931, p. 639, pl. 27, fig. 11.
Hypotype; 268; Pliocene; between Pico Canyon and Fernando Pass, Los Angeles Co., Calif.
- Galeodea apta* Tegland
Tegland, 1931, p. 415.
Paratype; 366, 367; Oligocene, Twin Rivers Shales; 1½ miles west of mouth of West Twin River, Clallam Co., Wash.
- Galeodea rex* Tegland
Tegland, 1931, p. 413.
Paratype; 363-365; Oligocene, Blakeley Formation; Bainbridge Island, Jefferson Co., Wash.
- Gyrineum (Bechtelia) strongi* Jordan
Emerson and Hertlein, 1964, p. 360, fig. 5g.
Hypotype; 818; Pleistocene; Isla Monserrate, Baja California, Mexico.
- Gyrineum lewisii* Carson
Carson, 1926, p. 53.
Paratype; 628; Pliocene, Fernando Formation; Fugler's Point, Santa Barbara Co., Calif.
- Hastula gnomon* Keen
Keen, 1943, p. 47.
Paratype; 606; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.
- Hyalina (Cystiscus) jewettii* (Carpenter)
Grant and Gale, 1931, p. 630, pl. 24, fig. 17.
Hypotype; 213; Pleistocene; San Pedro, Los Angeles Co., Calif.
- Kelletia (Kelletia) kelletii* (Forbes)
Grant and Gale, 1931, p. 642, pl. 28, fig. 7.
Hypotype; 276; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Lacuna divaricata* (Fabricus) variety *solidula* Lovén
Grant and Gale, 1931, p. 782, pl. 32, fig. 19.
Hypotype; 303; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Littorina scutulata Gould

Grant and Gale, 1931, p. 782, pl. 32, fig. 16-18.

Hypotype; 300 (fig. 16), 301 (fig. 17), 302 (fig. 18); Pleistocene; San Pedro, Los Angeles Co., Calif.

Margarites (Lirularia) aresta Berry

Berry, 1941, p. 13.

Paratype; 73; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Melampus olivaceus Carpenter

Grant and Gale, 1931, p. 461, pl. 24, fig. 16.

Hypotype; 212; Pleistocene; San Pedro, Los Angeles Co., Calif.

Miopleiona weaveri Tegland

(Tegland, 1933, p. 127, pl. 11, fig. 1, 2.)

Plastoholotype; 360; Oligocene, Blakeley Formation; Bainbridge Island, Jefferson Co., Wash.

Mistostigma punctulium Berry

Berry, 1947, p. 264 (10).

Paratype; 322-324; Pliocene; Bath-house Cliff, Santa Barbara, Santa Barbara Co., Calif.

Mitra catalinae (Dall)

Grant and Gale, 1931, p. 636, pl. 28, fig. 4.

Hypotype; 275; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.

Mitrella carinata (Hinds)

Grant and Gale, 1931, p. 692, pl. 26, fig. 35.

Hypotype; 248; Pleistocene; 1/2 mile south of Seacliff Railway Station, Ventura Co., Calif.

Mitrella carinata (Hinds) variety *gausapata* (Gould)

Grant and Gale, 1931, p. 693, pl. 26, fig. 44.

Hypotype; 253; Pleistocene; south of Seacliff Railway Station, Ventura Co., Calif.

Mitrella grandior Grant and Gale

Grant and Gale, 1931, p. 696, pl. 26, fig. 46.

Holotype; 6; Pliocene, Pico Formation; Canada de Aliso, Ventura Co., Calif.

Mitrella (Mitrella) anchuela Keen

Keen, 1943, p. 48.

Paratype; 612; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

Mitrella tuberosa (Carpenter)

Grant and Gale, 1931, p. 697, pl. 26, fig. 45.

Hypotype; 254; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.

Mitromorpha galeana Berry

Berry, 1941, p. 12.

Paratype; 54, 394; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Moniliopsis chacei Berry

Berry, 1941, p. 6.

Paratype; 347, 348; Pleistocene; "Hilltop Quarry", San Pedro, Los Angeles Co., Calif.

Moniliopsis graciosa (Arnold) variety *mercedensis* (Martin)

Grant and Gale, 1931, p. 569, pl. 26, fig. 30.

Hypotype; 245; Pleistocene, Las Posas Formation; north of Arroyo Santa Rosa, Ventura Co., Calif.

Moniliopsis incisa (Carpenter) variety *incisa* s.s.

Grant and Gale, 1931, p. 566, pl. 26, fig. 21.

Hypotype; 238; Pleistocene, La Posas Formation; north of Arroyo Santa Rosa, Ventura Co., Calif.

Moniliopsis incisa (Carpenter) variety *quinquecincta* Grant and Gale

Grant and Gale, 1931, p. 568, pl. 26, fig. 33.

Hypotype; 247; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.

Morula (Morunella) lugubris (C. B. Adams)

Emerson and Hertlein, 1964, p. 361, fig. 3k.

Hypotype; 804; Pleistocene; Isla Coronados, Baja California, Mexico.

Nassarius hildegardae Kanakoff

Kanakoff, 1956, p. 113.

Paratype; 341; Pliocene, Pico Formation; 1/2 mile south of Humphreys Railway Station, Los Angeles Co., Calif.

Nassarius (Schizopyga) californianus (Conrad)

Grant and Gale, 1931, p. 672, pl. 26, fig. 49.

Hypotype; 255; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.

See: *Nassarius (Tritia) californianus* (Conrad)*Nassarius (Schizopyga) fossatus* (Gould)

Grant and Gale, 1931, p. 675, pl. 26, fig. 55, 56.

Hypotype; 261 (fig. 55), 262 (fig. 56); Pleistocene; Southwest of Goleta, Santa Barbara Co., Calif.

See: *Nassarius (Tritia) fossatus* (Gould)*Nassarius (Schizopyga) mendicus* (Gould)

Grant and Gale, 1931, p. 674, pl. 26, fig. 54.

Hypotype; 260; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

- See: *Nassarius (Tritia) mendicus* (Gould)
- Nassarius (Schizopyga) mendicus* (Gould) variety *cooperi* (Forbes)
Grant and Gale, 1931, p. 674, pl. 26, fig. 40, 50.
Hypotype; 251 (fig. 40), 256 (fig. 50); Pleistocene, southwest of Goleta, Santa Barbara Co., Calif.
See: *Nassarius (Tritia) mendicus* (Gould) variety *cooperi* (Forbes)
- Nassarius (Schizopyga) perpinguis* (Hinds)
Grant and Gale, 1931, p. 673, pl. 26, fig. 51, 52.
Hypotype; 257 (fig. 51), 258 (fig. 52); 257: Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.; 258: Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
See: *Nassarius (Tritia) perpinguis* (Hinds)
- Nassarius (Tritia) californianus* (Conrad)
Grant and Gale, 1931, p. 941, pl. 26, fig. 49.
See: *Nassarius (Schizopyga) californianus* (Conrad)
- Nassarius (Tritia) fossatus* (Gould)
Grant and Gale, 1931, p. 675, pl. 26, fig. 55, 56.
See: *Nassarius (Schizopyga) fossatus* (Gould)
- Nassarius (Tritia) mendicus* (Gould)
Grant and Gale, 1931, p. 674, pl. 26, fig. 54.
See: *Nassarius (Schizopyga) mendicus* (Gould)
- Nassarius (Tritia) mendicus* (Gould) variety *cooperi* (Forbes)
Grant and Gale, 1931, p. 941, pl. 26, fig. 40, 50.
See: *Nassarius (Schizopyga) mendicus* (Gould) variety *cooperi* (Forbes)
- Nassarius (Tritia) perpinguis* (Hinds)
Grant and Gale, 1931, p. 673, pl. 26, fig. 51, 52.
See: *Nassarius (Schizopyga) perpinguis* (Hinds)
- Nassarius stocki* Kanakoff
Kanakoff, 1956, p. 110.
Paratype; 340; Pliocene, Pico Formation; 1/2 mile south of Humphreys Railway Station, Los Angeles Co., Calif.
- Nassarius (Uzita) amoldi* (Anderson) variety *whitneyi* (Trask)
Grant and Gale, 1931, p. 679, pl. 26, fig. 48a, 48b.
Hypotype; 7; Pliocene, Etchegoin Formation; near Tipton, Tulare Co., Calif.
- Neptunea (Colus) jordani* (Dall)
Grant and Gale, 1931, p. 663, pl. 28, fig. 11.
Hypotype; 277; Pleistocene (Pliocene?), Elk River Formation; north of mouth of Elk River, Curry Co., Oregon.
- Neptunea (Neptunea) andersoni* (Martin) variety *hawleyi* (Carson)
Grant and Gale, 1931, p. 655, pl. 28, fig. 9a-9c.
Hypotype; 317; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.
- Ocenebra squamulifer* (Carpenter)
See: *T.[rophan] squamulifer* Carpenter
- Odostomia* cf. (*Amaura*) *avellana* Carpenter
Grant and Gale, 1931, p. 954, pl. 32, fig. 20.
Hypotype; 304; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Odostomia* cf. (*Evalea*) *phanea* Dall and Bartsch
Grant and Gale, 1931, p. 933, pl. 24, fig. 25.
Hypotype; 218; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Olivella biphlicata* Sowerby
Grant and Gale, 1931, p. 625, pl. 24, fig. 15.
Hypotype; 211; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Olivella ischnon* Keen
Keen, 1943, p. 50.
Paratype; 613, 937; Miocene, Round Mountain Silt or Olcese Sand; Caliente Quadrangle, Kern Co., Calif.
- Olivella pedroana* (Conrad)
Grant and Gale, 1931, p. 626, pl. 24, fig. 10.
Hypotype; 206; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.
- Olivella santana* Loel and Corey
Loel and Corey, 1932, p. 240.
Paratype; 795, 796; Miocene, Vaqueros Formation; north of Coal Mine on south side of 1332' hill, Santa Ana Mountains, Orange Co., Calif.
- Pseudomelatoma penicillata* (Carpenter) variety *seminflata* Grant and Gale
Grant and Gale, 1931, p. 561, pl. 26, fig. 19.
Holotype; 237; Pleistocene; Santa Monica, Los Angeles Co., Calif.
- Puncturella punctocostata* Berry
Berry, 1947, p. 265 (11).
Paratype; 325, 326; Pleistocene, Lomita Formation; near 2nd and Pacific Streets, San Pedro, Los Angeles Co., Calif.

- Puncturella ralphi* Berry
Berry, 1947, p. 267 (13).
Paratype; 327; Pleistocene; 2nd and Pacific Streets, San Pedro, Los Angeles Co., Calif.
- Purpura (Jaton) eldridgei* (Arnold)
Grant and Gale, 1931, p. 708, pl. 32, fig. 1, 2a, 2b.
Hypotype; 288 (fig. 1), 289 (fig. 2a, 2b); Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Purpura (Jaton) festiva* (Hinds)
Grant and Gale, 1931, p. 708, pl. 32, fig. 3.
Hypotype; 290; Pleistocene; San Pedro, Los Angeles Co., Calif.
- Ranella (Priene) oregonensis* (Redfield)
Grant and Gale, 1931, p. 737, pl. 27, fig. 12.
Hypotype; 269; Pliocene, Pico Formation; Sulphur Canyon, Los Angeles Co., Calif.
- Rapana serrat* Wiedey
Wiedey, 1928, p. 116, pl. 9, fig. 4-6.
Holotype; 13; Miocene, Vaqueros Formation; Kavanaugh Creek, San Luis Obispo Co., Calif.
- Retusa (Acteocina) culcitella* (Gould)
Grant and Gale, 1931, p. 447, pl. 24, fig. 13.
Hypotype; 209; Pleistocene; Harmon Canyon, Ventura Co., Calif.
- Scissurella lyra* Berry
Berry, 1947, p. 268 (14).
Paratype; 328, 329; Pleistocene; 2nd and Pacific Streets, San Pedro, Los Angeles Co., Calif.
- Searlesia branneri* Clark and Arnold
(Clark and Arnold, 1923, p. 159, pl. 30, fig. 3a, 3b).
Plastoholotype; 22, 717; Oligocene or Miocene; Sooke Formation; Vancouver Island, British Columbia, Canada.
- Solenosteira merriami* Loel and Corey
Loel and Corey, 1932, p. 242.
Paratype; 797; Miocene, Vaqueros Formation; ridge between Vaqueros and Reliz creeks, Monterey Co., Calif.
- Spirotropis (Antiplanes) cf. bulimoides* (Dall)
Grant and Gale, 1931, p. 557, pl. 26, fig. 26.
Hypotype; 243; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Spirotropis (Antiplanes) perversa* (Gabb)
Grant and Gale, 1931, p. 553, pl. 26, fig. 22, 23a, 23b.
Hypotype; 239 (fig. 22), 240 (fig. 23a, 23b); Pleistocene; San Pedro, Los Angeles Co., Calif.
- Spirotropis (Antiplanes) perversa* (Gabb) variety *fernandoensis* (English)
Grant and Gale, 1931, p. 557, pl. 26, fig. 25.
Hypotype; 242; Pliocene, Pico Formation; Elsmere Canyon, Los Angeles Co., Calif.
- Spirotropis (Antiplanes) perversa* (Gabb) variety *pedroana* (Arnold)
Grant and Gale, 1931, p. 556, pl. 26, fig. 24, 32.
Hypotype; 241 (fig. 24), 246 (fig. 32); Pleistocene; San Pedro, Los Angeles Co., Calif.
- Spirotropis (Typhlomangelia) cf. renaudi* (Arnold)
Grant and Gale, 1931, p. 549, pl. 26, fig. 29.
Hypotype; 244; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.
- Strombina recurva* (Sowerby)
Grant and Gale, 1931, p. 699, pl. 26, fig. 38, 41.
Hypotype; 249 (fig. 38), 252 (fig. 41); Pleistocene?; Albemarle Island, Galapagos Islands.
- Surculites (Megasurcula) carpenterianus* (Gabb)
Grant and Gale, 1931, p. 497, pl. 25, fig. 4a, 4b.
Hypotype; 228; Pleistocene; east of Sexton Canyon, Ventura Co., Calif.
- Surculites (Megasurcula) remondii* (Gabb)
Grant and Gale, 1931, p. 495, pl. 25, fig. 5, 6.
Hypotype; 229 (fig. 5), 230 (fig. 6); Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.
- Tegula (Chlorostoma) funebris* (A. Adams)
Grant and Gale, 1931, p. 826, pl. 32, fig. 28, 29a, 29b.
Hypotype; 309 (fig. 28), 310 (fig. 29a, 29b); Pliocene, Pico Formation; 309: between Santa Paula Creek and Timber Canyon; 310: Canada de Aliso; Ventura Co., Calif.
- Tegula (Chlorostoma) gallina* (Forbes)
Grant and Gale, 1931, p. 827, pl. 32, fig. 30, 31.
Hypotype; 311 (fig. 30), 312 (fig. 31); Pliocene, Pico Formation; west (311) and east (312) of Fernando Pass, Los Angeles Co., Calif.
- Terebra (Strioterebrum) cf. dislocata* (Say)
Grant and Gale, 1931, p. 468, pl. 24, fig. 19.
Hypotype; 214; Pleistocene; Ventura, Ventura Co., Calif.

Terebra (subgenus = ?) *santana* Loel and Corey

Loel and Corey, 1932, p. 236.

Paratype; 790-793; Miocene; Vaqueros Formation; west side of Plano Trabuco, Orange Co., Calif.

Thais (*Nucella*) *elsmerensis* Grant and Gale

Grant and Gale, 1931, p. 719, pl. 32, fig. 13.

Holotype; 299; Pliocene, Pico Formation; east of Fernando Pass, Los Angeles Co., Calif.

Thais (*Nucella*) *shumanensis* Carson

Carson, 1926, p. 56.

Paratype; 629; Pliocene, Fernando Formation; railway cut 1/2 mile north of Schuman, Santa Barbara Co., Calif.

Tritonalia *foveolata* (Hinds)

Grant and Gale, 1931, p. 709, pl. 32, fig. 11.

Hypotype; 297; Pleistocene; Adams Canyon, Ventura Co., Calif.

Tritonalia *lurida* (Middendorff) variety *aspera* (Baird)

Grant and Gale, 1931, p. 711, pl. 32, fig. 4.

Hypotype; 291; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Tritonalia *lurida* (Middendorff) variety *munda* (Carpenter)

Grant and Gale, 1931, p. 712, pl. 32, fig. 5.

Hypotype; 292; Pleistocene; southwest of Goleta, Santa Barbara Co., Calif.

Tritonalia *poulsoni* (Nuttall in Carpenter)

Grant and Gale, 1931, p. 712, pl. 32, fig. 10.

Hypotype; 296; Pleistocene; San Pedro, Los Angeles Co., Calif.

Tritonalia *inezana* Loel and Corey

Loel and Corey, 1932, p. 248.

Paratype; 798-800; Miocene, Vaqueros Formation; 2.5 miles southwest of Buellton, Santa Barbara Co., Calif.

Trophon (*Boreotrophon*) *orpheus* (Gould)

Grant and Gale, 1931, p. 722, pl. 32, fig. 9.

Hypotype; 295; Pliocene, Pico Formation; Sulphur Canyon, Ventura Co., Calif.

T. [rophon] *squamulifer* Carpenter

Carpenter in Gabb, 1869, p. 44.

Plastoholotype; 952a, 952b, 953; Pleistocene; Santa Barbara, Santa Barbara Co., Calif.

See: *Ocenebra squamulifer* (Carpenter)

Turbonilla (*Pyrgiscus*) *bravoensis* Keen

Keen, 1943, p. 51.

Paratype; 614, 934; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

Turbonilla (*Pyrgolampros*) *idaea* (T. S. Oldroyd)

Grant and Gale, 1931, p. 869, pl. 24, fig. 23.

Hypotype; 316; Pleistocene; Kalorama Canyon, Ventura, Ventura Co., Calif.

Turbonilla (*Pyrgolampros*) *mariposa* Keen

Keen, 1943, p. 52.

Paratype; 615, 935; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

Turricula *santacruzana* Arnold

Arnold, 1908, p. 373.

Paratype; 625; Oligocene, San Lorenzo Formation; on San Lorenzo River 3 miles above town of Boulder Creek, Santa Cruz Co., Calif.

Turritella *bosei* Hertlein and Jordan

Wiedey, 1928, p. 117, pl. 10, fig. 7, pl. 11, fig. 1, 2.

Hypotype; 44 (fig. 7), 45 (fig. 1), 46 (fig. 2); Miocene, Temblor Formation; 44: Barker's Ranch, Kern Co., Calif.; 45, 46: 2 miles southeast of El Modena, Orange Co., Calif.

Turritella *cooperi* Carpenter

Grant and Gale, 1931, p. 771, pl. 24, fig. 28-34.

Hypotype; 221 (fig. 28), 222 (fig. 29), 223 (fig. 30), 224 (fig. 31), 225 (fig. 32), 226 (fig. 33), 227 (fig. 34); Pleistocene; San Pedro, Los Angeles Co., Calif.

Turritella *inezana* Conrad

Wiedey, 1928, p. 120, pl. 12, fig. 2.

Hypotype; 48; Miocene, Vaqueros Formation; 5 miles east of San Luis Obispo, San Luis Obispo Co., Calif.

Turritella inezana Conrad var. *pertunida* Wiedey

Wiedey, 1928, p. 119, pl. 12, fig. 1.

Holotype; 14; Miocene, Vaqueros Formation; Canyon de Piedra, San Luis Obispo Co., Calif.

Turritella inezana Conrad var. *sespensis* Arnold

Wiedey, 1928, p. 121, pl. 12, fig. 4.

Hypotype; 49; Miocene, Vaqueros Formation; Squaw Flat, Ventura Co., Calif.

Turritella *jewettii* Carpenter

Grant and Gale, 1931, p. 770, pl. 24, fig. 26, 27.

Hypotype; 219 (fig. 26), 220 (fig. 20); Pleistocene; San Pedro, Los Angeles Co., Calif.

- Turritella montereyana* Wiedey
Wiedey, 1928, p. 123, pl. 21, fig. 3.
Syntype; 51; Miocene, Monterey Formation; 1.5 miles south of San Antonio River, Monterey Co., Calif.
- Turritella ocoyana* Conrad
Wiedey, 1928, p. 120, pl. 10, fig. 1, 3.
Hypotype; 43 (fig. 3; missing), 47 (fig. 1); Miocene, Temblor Formation; 2 miles west of Simmler, San Luis Obispo Co., Calif.
- Turritella temblorensis* Wiedey
Wiedey, 1928, p. 122, pl. 11, fig. 4.
Holotype; 14; Miocene, Temblor Formation; Santa Monica Mtns., Los Angeles Co., Calif.
- Turritella vanlecki* Arnold
Grant and Gale, 1931, p. 773, pl. 24, fig. 22.
Hypotype; 217; Pliocene, Pico Formation; Holser Canyon, Los Angeles Co., Calif.
- Turritella variata* Conrad
Wiedey, 1928, p. 120, pl. 12, fig. 8.
Hypotype; 50; Miocene, Vaqueros Formation; 5 miles east of San Luis Obispo, San Luis Obispo Co., Calif.
- Vasum (Vasum) pufferi* Emerson
Emerson, 1964, p. 11.
Homeotype; 703, 747; Pliocene, Imperial Formation; Coyote Mountain (= Carrizo Mountain), Imperial Co., Calif.
- Vexillum (Uromitra) healey* Fargo
Fargo, 1948, p. 110.
Paratype; 909-913; Pliocene; north part of St. Petersburg, Pinellas Co., Florida.
- Viviparus washingtonianus* Arnold and Hannibal
Hannibal, 1913, p. 194.
Paratype; 626; Eocene, Tejon Formation; on Olequa Creek 2 miles north of Little Falls, Washington.
- Volvulella gluma* Keen
Keen, 1943, p. 54.
Paratype; 616; Miocene, Round Mountain Silt; Caliente Quadrangle, Kern Co., Calif.

ARTHROPODA

Trilobita

- Achatella carleyi* (Meek)
Howell, 1951, p. 287, pl. 8, fig. 5.
Hypotype; 877; Ordovician?, Fairmount Formation?, Cincinnati, Ohio.
- Anchiopsis anchiops* (Green)
Howell, 1951, p. 286, pl. 8, fig. 3.
Plastoholotype; 875; Devonian; Ulster Co., New York.
See: *Calymene anchiops* Green
- Bathyurus extans* (Hall)
Howell, 1951, p. 264, pl. 1, fig. 5-7.
Hypotype; 828 (fig. 5), 829 (fig. 6), 830 (fig. 7); Ordovician, Black River Formation; Great Bend, Jefferson Co., New York.
- Brachymetopus cuyahogae* (Claypole)
Howell, 1951, p. 274, pl. 6, fig. 1.
Hypotype; 854; Mississippian, Cuyahoga Formation; Akron, Ohio.
- Bumastus armatus* (Hall)
Howell, 1951, p. 268, pl. 3, fig. 4-6.
Hypotype; 840 (fig. 4), 841 (fig. 5), 842 (fig. 6); Silurian, Racine Formation; Bridgeport, Illinois.
- Bumastus chicagoensis* (Weller)
Howell, 1951, p. 267, pl. 3, fig. 3.
Hypotype; 839; Silurian, Racine Formation; Bridgeport, Illinois.
- Bumastus cuniculus* (Hall)
Howell, 1951, p. 269, pl. 3, fig. 7, pl. 5, fig. 1.
Hypotype; 843 (fig. 7); 847 (fig. 1); Silurian, Racine Formation; Wauwatosa, Wisconsin.
- Bumastus ? vogdesi* Howell
Howell, 1951, p. 269, pl. 3, fig. 2.
Holotype; 838; Silurian; Dug Gap, Walker Co., Georgia.
- Calymene anchiops* Green
Green, 1832, p. 35.
Plastoholotype; 875; Devonian; Ulster Co., New York.
See: *Anchiopsis anchiops* (Green)

Calymene clintoni (Vanuxem)

Vogdes, 1880, p. 178, fig. 3.

Hypotype: 865; Taylor's Ridge near Catoosa Station, Catoosa Co., Georgia.

See: *Calymene vogdesi* Foerste

Vogdes, 1886, p. 5, fig. 3.

Hypotype: 865; Taylor's Ridge near Catoosa Station, Catoosa Co., Georgia

Calymene rostrata Vogdes

Vogdes, 1879, p. 477.

Syntype: 868-872; Silurian, Clinton Group; Taylor's Ridge, Catoosa Station, Catoosa Co., Georgia.

See: *Calymenella rostrata* (Vogdes)

Vogdes, 1880, p. 176, text-fig. 1, 2.

Syntype: 868 (fig. 1), 870 (fig. 2); Silurian, Clinton Group; Taylor's Ridge, Catoosa Station,

Catoosa Co., Georgia.

Vogdes, 1886, p. 2, text-fig. 1, 2.

Syntype: 868 (fig. 1), 870 (fig. 2); Silurian, Clinton Group; Taylor's Ridge, Catoosa Station,

Catoosa Co., Georgia.

Calymene vogdesi Foerste

Foerste, 1887, p. 95.

See: *Calymene clintoni* (Vanuxem)

Howell, 1951, p. 280, pl. 7, fig. 5-7.

Hypotype: 865 (fig. 5), 866 (fig. 6), 867 (fig. 7); Silurian; 865: Taylor's Ridge near Catoosa Station, Catoosa Co., Georgia; 866, 867: Dug Gap, Walker Co., Georgia.

Calymenella rostrata (Vogdes)

Howell, 1951, p. 283, pl. 7, fig. 8-10.

Syntype: 868 (fig. 8), 869 (fig. 9), 870 (fig. 10), 871, 872; Silurian, Clinton Group; Taylor's Ridge, Catoosa Station, Catoosa Co., Georgia.

See: *Calymene rostrata* Vogdes

Ceratocephala anchoralis (Miller)

Howell, 1951, p. 277, pl. 7, fig. 2.

Hypotype: 861; Ordovician, Maysville Formation; Cincinnati region, Ohio.

Ceratocephala longispina (Mitchell)

Howell, 1951, p. 305, pl. 13, fig. 1-2.

Hypotype: 900 (fig. 1), 901 (fig. 2); Silurian, Bowning Series; Bowning Village, County Harden, New South Wales, Australia.

Ceraurus pleurexanthemus Green

Howell, 1951, p. 284, pl. 8, fig. 1, 2.

Hypotype: 873 (fig. 1), 874 (fig. 2); Ordovician; 873: Trenton Formation?, New York; 874: Trenton Formation, Trenton Falls, New York.

Corycephalus dentatus (Barrett)

Howell, 1951, p. 286, pl. 8, fig. 4.

Hypotype: 876; Devonian; Port Jervis, New York.

Cyphaspis christyi Hall

Howell, 1951, p. 274, pl. 5, fig. 7, 8.

Hypotype: 852; Silurian, Niagaran Group; ?Waldron Formation; ?Waldron, ?Indiana.

Cyphaspis yassensis Etheridge and Mitchell

Howell, 1951, p. 303, pl. 12, fig. 1-2.

Hypotype: 895 (fig. 1), 896 (fig. 2); Silurian, Bowning Series; Belle Vale, New South Wales, Australia.

Encrinurus americanus Vogdes

Vogdes, 1886, p. 1.

Syntype: 862, 863; Plastosyntype: 864; Silurian, Clinton Group; Taylor's Ridge, west of Catoosa Station, Catoosa Co., Georgia.

Howell, 1951, p. 278, pl. 7, fig. 3, 4.

Syntype: 862 (fig. 3), 863; plastosyntype: 864 (cast from 863) (fig. 4); Silurian, Clinton Group; Taylor's Ridge, west of Catoosa Station, Catoosa Co., Georgia.

Eophacops catoosacensis Howell

Howell, 1951, p. 289, pl. 10, fig. 2-4.

Holotype: 882 (fig. 2); paratype: 883 (fig. 3), 884 (fig. 4), 885; Silurian, Clinton Group; bank of Chicamauga River at the Ringgold end of the bridge on the road from Catoosa Station to Ringgold, Georgia.

Griffithides bufo Meek and Worthen

Howell, 1951, p. 277, pl. 6, fig. 6; pl. 7, fig. 1.

Hypotype: 859 (pl. 6, fig. 6); Plastohypotype: 860 (pl. 7, fig. 1); Mississippian, Keokuk Group; Crawfordsville, Indiana.

Griffithides conwayensis Wheeler

(Wheeler, 1935, p. 52, pl. 6, fig. 4, 5.)

Plastoholotype: 388; Pennsylvanian, Atoka Formation; Conway Co., Arkansas.

See: *Griffithides ornata* Vogdes

- Griffithides nosoniensis* Wheeler
(Wheeler, 1935, p. 51, pl. 6, fig. 6, 7.)
Plastoholotype; 389; Permian, Nosoni Formation; ridge between Potter and Marble Creeks, Shasta Co., Calif.
- Griffithides ornata* Vogdes
(Vogdes, 1895, p. 589, text-fig.)
Plastoholotype; 388; Pennsylvanian, Atoka Formation; Conway Co., Arkansas.
See: *Griffithides conwayensis* Wheeler
- Isotelus gigas* Dekay
Howell, 1951, p. 265, pl. 2, fig. 3, pl. 3, fig. 1, pl. 4, fig. 1.
Hypotype; 835 (pl. 2, fig. 3); 837 (pl. 3, fig. 1); 846 (pl. 4, fig. 1); Ordovician; 835: Trenton Formation, Herkimer Co., New York; 837: Kentucky; 846: "probably Kentucky or Cincinnati region".
- Lloydia parva* Howell
Howell, 1951, p. 263, pl. 1, fig. 3, 4.
Holotype; 825 (fig. 3), 826 (fig. 4), 827; Cambrian, Levis Conglomerate (Cambrian pebble in Ordovician conglomerate); Point Levis, Quebec, Canada.
- Loganellus macropleurus* Rasetti
Howell, 1951, p. 263, pl. 1, fig. 2.
Hypotype; 824; Cambrian, Levis Conglomerate (Cambrian pebble in Ordovician conglomerate); Point Levis, Quebec, Canada.
- Odontopleura jenkinsi* Etheridge and Mitchell
Howell, 1951, p. 304, pl. 12, fig. 4.
Hypotype; 898; Silurian, Bowning Series; "presumably" Bowning railway station yard, Bowning Village, County Harden, New South Wales, Australia.
- Odonotopleura rattei* Etheridge and Mitchell
Howell, 1951, p. 304, pl. 12, fig. 3.
Hypotype; 897; Silurian, Bowning Series; Bowning Village, County Harden, New South Wales, Australia.
- Ogygites canadensis* (Chapman)
Howell, 1951, p. 265, pl. 1, fig. 8, pl. 2, fig. 1, 2.
Hypotype; 831 (fig. 8), 833 (fig. 1), 834 (fig. 2); Ordovician, Collingwood Formation; Georgian Bay, Ontario, Canada.
- Phacops cacapona* Hall
Howell, 1951, p. 288, pl. 9, fig. 2-4.
Hypotype; 879; Devonian?, Hamilton Group?, Capon Springs, West Virginia.
- Phacops crosslei* Etheridge and Mitchell
Howell, 1951, p. 307, pl. 13, fig. 3-4.
Hypotype; 902 (fig. 3), 903 (fig. 4); Silurian, Bowning Series; Bowning Village, County Harden, New South Wales, Australia.
- Phacops hudsonica* Hall
Howell, 1951, p. 288, pl. 9, fig. 5, pl. 10, fig. 1.
Hypotype; 880; Devonian; western Tennessee.
- Phacops rana* (Green)
Howell, 1951, p. 288, pl. 9, fig. 1.
Hypotype; 878; Devonian, Hamilton Group; London, Ontario, Canada.
- Phacops serratus* Foerste
Howell, 1951, p. 307, pl. 12, fig. 5.
Hypotype; 899; Silurian, Bowning Series; near the railway station, Bowning, County Harden, New South Wales, Australia.
- Phillipsia insignis* Winchell
Howell, 1951, p. 275, pl. 5, fig. 9.
Hypotype; 853; Mississippian, ?Burlington Limestone; Curryville, Missouri.
- Phillipsia major* Shumard
Howell, 1951, p. 275, pl. 6, fig. 2, 3.
Hypotype; 855 (fig. 2), 856 (fig. 3); Pennsylvanian; Kansas City, Missouri.
- Phillipsia sampsoni* Vogdes
Howell, 1951, p. 276, pl. 6, fig. 4.
Hypotype; 857; Mississippian, Chouteau Formation; Banks, Pettis Co., Missouri.
- Phillipsia stevensoni* Meek
Howell, 1951, p. 276, pl. 6, fig. 5.
Hypotype; 858; Mississippian, Chester Group; Monongalia Co., West Virginia.
- Proetus*, Species undetermined
Howell, 1951, p. 270, pl. 5, fig. 2.
Hypotype; 848; Silurian; Taylor's Ridge near Catoosa Station, Catoosa Co., Georgia.
- Proetus bairdensis* Wheeler
(Wheeler, 1935, p. 49, pl. 6, fig. 1-3).
Plastoholotype; 390 (fig. 1, 3); plastoparatype; 339 (fig. 1, 2); Pennsylvanian?, Baird Formation;

Redding Quadrangle, Shasta Co., Calif.

Howell, 1951, p. 272, pl. 5, fig. 6.

Hypotype; 851; Pennsylvanian?, Baird Formation; Redding Quadrangle, Shasta Co., Calif.

Proetus crassimarginatus (Hall)

Howell, 1951, p. 271, pl. 5, fig. 3.

Hypotype; 849; Devonian, Onondaga Formation; Kelly Island, Lake Erie.

Proetus doris Hall

Hall, 1860, p. 112.

Plastosynotype; 845; Carboniferous, Goniatile Limestone; Rockford, Indiana.

Howell, 1951, p. 271, pl. 3, fig. 8, 9.

Plastohypotype; 844 (fig. 8); plastosynotype; 845 (fig. 9); Carboniferous, Goniatile Limestone; Rockford, Indiana.

Proetus baldemani Hall

Howell, 1951, p. 272, pl. 5, fig. 4, 5.

Hypotype; 850; Devonian, Hamilton Formation; Judd's Falls, on the road between Cherry Valley and Sharon Springs, New York.

Proetus parviusculus Hall

Howell, 1951, p. 270, pl. 1, fig. 9, 10.

Hypotype; 832; Ordovician, Corryville Formation; Cincinnati, Ohio.

Proetus rattei Etheridge and Mitchell

Howell, 1951, p. 303, pl. 11, fig. 5.

Hypotype; 894; Silurian, Bowning Series; Bowning, County Harden, New South Wales, Australia.

Richardsonella unisulcata Rasetti

Howell, 1951, p. 263, pl. 1, fig. 1.

Hypotype; 823; Cambrian, Levis Conglomerate (Cambrian pebble in Ordovician conglomerate); Point Levis, Quebec, Canada.

Scutellum bowningense (Etheridge and Mitchell)

Howell, 1951, p. 301, pl. 10, fig. 7.

Hypotype; 888; Silurian, Bowning Series; Bowning Creek, County Harden, New South Wales, Australia.

Scutellum jenkinsi (Etheridge and Mitchell)

Howell, 1951, p. 302, pl. 10, fig. 8; pl. 11, fig. 1-3.

Hypotype; 889 (fig. 8), 890 (fig. 1), 891 (fig. 2), 892 (fig. 3); Silurian, Bowning Series; Bowning Creek, County Harden, New South Wales, Australia.

Scutellum longispinifex (Mitchell)

Howell, 1951, p. 302, pl. 11, fig. 4.

Hypotype; 893; Silurian, Bowning Series; Bowning, County Harden, New South Wales, Australia.

Scutellum partschi (Barrande)

Howell, 1951, p. 293, pl. 10, fig. 5, 6.

Hypotype; 886 (fig. 5), 887 (fig. 6); Silurian; Lochkow, Bohemia.

Vogdesia vigilans (Meek and Worthen)

Howell, 1951, p. 267, pl. 2, fig. 4.

Hypotype; 836; Silurian, Maquoketa Formation; Fayette County, Iowa.

Arachnida

Calciro fisheri Petrunkevitch

Petrunkevitch, 1945, p. 323, pl. 1, right fig.; text-fig. 6.

Paratype; 1137; Middle Cenozoic or younger; Bonner Quarry, north side of Black Mesa, about 10 miles southwest of Ashfork, Yavapai Co., Arizona.

Crustacea

Actinocythereis allisoni Holden

Holden, 1964, p. 418, text-fig. 22a, 22b.

Holotype; 1004 (fig. 22a); paratype; 1005 (fig. 22b); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Amphicytherura iniqua Holden

Holden, 1964, p. 414, text-fig. 19a, 19c, 19e-19g.

Holotype; 994 (fig. 19a); paratype; 995 (fig. 19c); 996 (fig. 19e, 19f); 997a (fig. 19g); 997b; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Argilloccia constricta Holden

Holden, 1964, p. 403, text-fig. 9a-9c.

Holotype; 971; Cretaceous Rosario Formation; near Carlsbad, San Diego Co., Calif.

Bairdoppilata cretacea Holden

Holden, 1964, p. 400, text-fig. 7a-7c, 7f-7i.

Holotype; 965 (fig. 7a-7c); paratype; 966 (fig. 7f), 967 (fig. 7g), 968 (fig. 7h), 969 (fig. 7i); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Brachycythere darensis Swain

Holden, 1964, p. 405, text-fig. 11a-11c, 11e.

Hypotype; 973 (fig. 11a); 974 (fig. 11b); 975 (fig. 11c); 976 (fig. 11e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Callianassa stephensi Rathbun

Rathbun, 1926, p. 122.

Paratype; 920-925; Pleistocene; Spanish Bight, San Diego, San Diego Co., Calif.

Cancer branneri Rathbun

Rathbun, 1926, p. 63.

Paratype; 915; Pleistocene; San Pedro, Los Angeles Co., Calif.

Cythereis brooksi Holden

Holden, 1964, p. 419, text-fig. 23a-23c.

Holotype; 1006 (fig. 23a, 23b); paratype; 1007 (fig. 23c); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytherella elliotti Holden

Holden, 1964, p. 397, text-fig. 4b, 4c.

Holotype; 958; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytherella terminopunctata Holden

Holden, 1964, p. 396, text-fig. 3a, 3c, 3d.

Holotype; 955 (fig. 3c); paratype; 956 (fig. 3a); 957 (fig. 3d); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytherelloidea directiangua Holden

Holden, 1964, p. 399, text-fig. 6a-6c.

Holotype; 963 (fig. 6a-6c); paratype; 964 (fig. 6d, 6e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytherelloidea milowi Holden

Holden, 1964, p. 398, text-fig. 5a-5e.

Holotype; 959 (fig. 5a); paratype; 960 (fig. 5b); 961 (fig. 5c); 962a (fig. 5d); 962b (fig. 5e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytheropteron coryelli carlsbadensis Holden

Holden, 1964, p. 409, text-fig. 14a-14e.

Holotype; 981 (fig. 14a, 14c, 14d); paratype; 982 (fig. 14b); 983 (fig. 14e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Cytherura (?) *divaricata* Holden

Holden, 1964, p. 407, text-fig. 13a, 13b, 13e.

Holotype; 978 (fig. 13a); paratype; 979 (fig. 13b); 980 (fig. 13e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Eocytheropteron turgidulum Holden

Holden, 1964, p. 410, text-fig. 15a-15c.

Holotype; 984; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Eucytherura planolata Holden

Holden, 1964, p. 412, text-fig. 17a-17c.

Holotype; 988 (fig. 17a, 17b); paratype; 989 (fig. 17c); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Eucytherura spinata Holden

Holden, 1964, p. 413, text-fig. 18a-18e.

Holotype; 990 (fig. 18a, 18b); paratype; 991 (fig. 18c); 992 (fig. 18d); 993 (fig. 18e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Eucytherura versabilis Holden

Holden, 1964, p. 410, text-fig. 16b-16e.

Holotype; 985 (fig. 16b); paratype; 986 (fig. 16c); 987 (fig. 16d, 16e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Idiocythere triebeli Holden

Holden, 1964, p. 422, text-fig. 25a-25c.

Holotype; 1012 (fig. 25a, 25b); paratype; 1013 (fig. 25c); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Isocythereis carlsbadensis Holden

Holden, 1964, p. 423, text-fig. 26a-26f.

Holotype; 1014 (fig. 26a-26c); paratype; 1015 (fig. 26d-26f); 1016; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Kriehi cushmani carlsbadensis Holden

Holden, 1964, p. 406, text-fig. 12a-12c.

Holotype; 977; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Neocythere (Physocythere) formicata Holden

Holden, 1964, p. 404, text-fig. 10a-10e.

Holotype; 972 (fig. 10a-10c); paratype; 1066 (fig. 10d); 1067 (fig. 10e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Paijcnborchella pseudotrígona Holden

Holden, 1964, p. 415, text-fig. 20a, 20b, 20d, 20e.

Holotype; 998 (fig. 20a, 20b); paratype; 999 (fig. 20d); 1000 (fig. 20e); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Paracypris fragilis Holden

Holden, 1964, p. 402, text-fig. 8a.

Holotype; 970; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Platycosta oena Holden

Holden, 1964, p. 421, text-fig. 24d-24g.

Holotype; 1008 (fig. 24g); paratype; 1009; 1010 (fig. 24d); 1011 (fig. 24e, 24f); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Randallia pleistocenica Rathbun

Rathbun, 1926, p. 77.

Paratype; 916-919; Pleistocene; San Pedro, Los Angeles Co., Calif.

Trachyleberis acuminata Holden

Holden, 1964, p. 416, text-fig. 21a-21d.

Holotype; 1001 (fig. 21a); paratype; 1002 (fig. 21b); 1003 (fig. 21c, 21d); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Unidentified ostracod

Holden, 1964, p. 426, text-fig. 28a-28b.

Hypotype; 1023 (fig. 28a); 1024 (fig. 28b); Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

Xestoleberis minuta Holden

Holden, 1964, p. 425, text-fig. 27a-27c.

Holotype; 1017a (fig. 27a, 27c); 1017b (fig. 27b); paratype; 1018-1022; Cretaceous, Rosario Formation; near Carlsbad, San Diego Co., Calif.

ECHINODERMATA

Cidaris sp.

Grant and Hertlein, 1938, p. 7.

Hypotype; 351; Pliocene, San Diego Formation; Pacific Beach, San Diego, San Diego Co., Calif.

See: *Hesperocidaris perplexa* H. L. Clark

Dendraster casseli Grant and Hertlein

Grant and Hertlein, 1938, p. 81.

Paratype; 30; Pliocene; about 6 miles slightly north of west of Newhall, Los Angeles Co., Calif.

Emerson and Hertlein, 1964, p. 365, fig. 5a-5c.

Hypotype; 814 (5a), 815 (5b), 816 (5c); Pliocene; Isla San José, Baja California, Mexico.

Dendraster cf. *D. granti* Durham

Emerson and Hertlein, 1964, p. 365, fig. 5f.

Hypotype; 817; Pliocene; Isla San José, Baja California, Mexico.

Dendraster vizcainoensis Grant and Hertlein

Grant and Hertlein, 1938, p. 90, pl. 8, fig. 1-3.

Holotype; 881; Pleistocene; Punta Santa Rosalia, Bahía de Sebastian Vizcaino, Baja California, Mexico.

Encope californica Verrill

Emerson and Hertlein, 1964, p. 365, fig. 6a-6e.

Hypotype; 819 (6a-6c); 820 (6d-6e); Pleistocene; Isla Monserrate, Baja California, Mexico.

Encope grandis L. Agassiz

Emerson and Hertlein, 1964, fig. 6f-6i.

Hypotype; 821 (6f), 822 (6g-6i); Pleistocene; Isla Monserrate, Baja California, Mexico.

Encope tenuis Kew

Hertlein and Grant, 1960, p. 126, pl. 25, fig. 4.

Hypotype; 352; Pliocene, San Diego Formation; 31st St. and Logan Ave., San Diego, San Diego Co., Calif.

Hesperocidaris perplexa H. L. Clark

Hertlein and Grant, 1960, p. 105, pl. 24, fig. 12.

Hypotype; 351; Pliocene, San Diego Formation; Pacific Beach, San Diego, San Diego Co., Calif.

See: *Cidaris* sp.

Megapetalus lovenioides Clark

(Clark, 1929, p. 260, pl. 31, fig. 1-6).

Plastoholotype; 72, 730, 31; Miocene; divide between Sulphur and Coche canyons, Ventura Co., Calif.

Merriamaster cf. *M. israelskyi* E. K. Jordan and Hertlein

Hertlein and Grant, 1960, p. 122, pl. 23, fig. 10.

Hypotype; 350; Pliocene, San Diego Formation; Cabrillo Canyon, Balboa Park, San Diego, San Diego Co., Calif.

Oligopygus putnami Israelsky

(Israelsky, 1933, p. 275, pl. 18, fig. 1, 2, 4).

Plastosyntype; 422 (fig. 1), 423 (fig. 2), 424 (fig. 4); Eocene; 12 kilometers northeast of Abasola, Tamaulipas, Mexico.

Scutaster vaquerosensis var. *keni* Loel and Corey

Loel and Corey, 1932, p. 180.

Paratype; 774; Miocene, Vaqueros Formation; west side of Grimes Canyon, about one mile from the mouth, Ventura Co., Calif.

Spatangus tapinus Schenck

Schenck, 1928, p. 198, pl. 24, fig. 1, 3, 4.

Holotype; 52; Eocene, Tejon Formation; Timber Canyon, Ventura Co., Calif.

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